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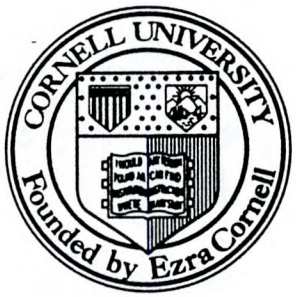
Region 1 - Suffolk - Riverhead

CORNELL UNIVERSITY

LONG ISLAND HORTICULTURAL RESEARCH LABORATORY

1997 ANNUAL REPORT



3059 Sound Avenue
Riverhead, New York 11901

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CORNELL UNIVERSITY

Long Island Horticultural Research Laboratory
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A major addition to the facilities of the Long Island Horticultural Research Laboratory took place in 1997. A new greenhouse complex with state of the art environmental controls was built. Although the project is not complete at the time of this writing it should be ready early in 1998. The complex replaces two glasshouses acquired in the 1920s and three plastic covered greenhouses.

The greenhouse project is supported by funds from the State University of New York. The complex has a total growing area of approximately 11,000 sq. ft. with nine individual growing sections. Each unit is equipped to control temperature and photoperiod. A master computer will regulate heat, ventilation, shade and black out screen, and high pressure sodium lights to provide desired environments for research projects. Plants will be watered either by an overhead or an ebb and flood watering system. Two sections have the option of having floor heat. The complex is capable of providing environmental controls for a host of experiments on all major horticultural crops important to Long Island.

The annual report provides in highlights results for a major portion of the research activities conducted by Cornell research and extension personnel. For more detailed information on specific projects please contact investigators listed.

We are especially grateful for the support and efforts of the individuals who make up the LIHRL Advisory Council. These industry/agency representatives are true leaders in their respective horticultural commodities, and we value their guidance and assistance. Industry/agency representatives who were on the Council in 1997: Henry Kraszewski, Ernest Lewin, Pat Voges, William Nastyn, Charles Massoud, Henry Talmage, Leonard DeLalio, Joseph Gergela, Gene Castellano and Luke Schoen

The LIHRL Advisory Council, Commodity Advisory Committees and the Friends of Long Island Horticulture are important components of the activities at the LIHRL. Individuals in these groups provide advice and support that is necessary to address pertinent problems facing the horticultural enterprises on Long Island. The staff wishes to express its appreciation to all who have contributed their time and material support. Special thanks go to the individuals who make up the Friends of Long Island Committee and its network of individuals who have solicited funds to support research and extension projects important to Long Island. Thanks are also extended to the individuals who have supported the cause.

The industry representatives on the "Friends Committee" are: Jack Van de Wetering, Robert VanBourgondien, Fred Hicks, Jeff Kircher, and Lyle Wells.

In addition to the information in this report, more details are available in the list of the following publications:

1997 Long Island Potato Variety and Cultural Practices Results, Dept. of Fruit and Vegetable Science Report No. 66.

1997 New York Vegetable Variety and Cultural Practices Results, Dept. of Fruit and Vegetable Science Report No. 67.

1997 Results - Weed Science Research, Dept. of Fruit and Vegetable Science.

1997 Annual Report – NYS IPM Program

1997 Insecticide Management of the Colorado Potato Beetle: Long Island 1997.

The majority of the LIHRL's financial support is provided by county, state and federal funds administered by Cornell University. In addition, the following companies, associations and growers have provided plant material, equipment, supplies or grants-in-aid. Industry support is vital for supplementing general operational funds and is greatly appreciated.

Abbott Laboratories
Abramowski Farms
Agtrol Chemical Products
American Cyanamid Co.
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Asgrow Seed
Ball Horticulture
Ball Publishing
BASF
Bayer Corp.
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Stokes Seeds, Inc.
Tagawa Greenhouses
Texel, Inc.
The Plantage
U.S. Forest Service
Uniroyal Corp.
USDA-IR-4 Program
Valent USA, Inc.
Van de Wetering Greenhouses
Vigoro, Inc.
W. A. Cleary Co.
Wagner Greenhouses
Wells Farm
William Lindsay Farm
Yoder Bros.
Zeneca

1997 - Staff at the LIHRL

Professional Staff	*Department*	*Commodity Responsibility*
Andrew Corbin	University Cooperative Ext.	Area IPM Extension Educator
Margery Daughtrey	Plant Pathology	Ornamentals/Greenhouse Crops
Daniel Gilrein	Cooperative Extension	IPM/Entomology/Cross-Commodity
Margaret McGrath	Plant Pathology	Vegetables
Andrew Senesac	Cooperative Extension	Weed Science/Cross-Commodity
Nina Shishkoff	Plant Pathology	Vegetables
Joseph B. Sieczka	Fruit and Vegetable Science	Potatoes/Vegetables
Alice Wise	Cooperative Extension	Wine/Grapes

Professor Emeritus

Arthur Bing	Floriculture & Orn. Hort.	Weed Science/Ornamentals

Visiting Fellow

Marzena Masierowska	Fruit and Vegetable Science	Potatoes/Vegetables

Graduate Student

Iwona Rybus	Fruit and Vegetable Science	Potatoes/Vegetables

Cooperative Extension Staff with LIHRL Projects

Scott Clark	Nursery Specialist
Ralph Freeman	Floriculture Specialist
Caroline Kiang	Home Horticulture Specialist
Dale Moyer	Vegetable/Potato Specialist
William Sanok	Ag Program Leader

Permanent Support Staff

Carole Brush	LIHRL	Office Manager
Douglas Gergela	Fruit and Vegetable Science	Potatoes/Vegetables
Maria Macksel	Plant Path/Flor. & Orn. Hort.	Ornamentals/Grnhse Crops
Sandra Mulvaney	LIHRL	Secretary
Robert Neese	LIHRL	Asst. Farm Manager
Bennett Orlowski	LIHRL	Farm Manager
Lucille Siracusano	Cooperative Extension	Research Technician
Mark Sisson	LIHRL	Field Assistant
Irene Tsontakis-Bradley	Cooperative Extension	Research Technician
Gerard Zeltmann	LIHRL	Field Assistant

Temporary Support Staff

Jennifer Arnold	Plt Path-Veg	Angela Hill	Coop Ext.
Susan Butterworth	Plt Path-Veg/Weed Sci	Roger Martin	Coop. Ext.
Mary Creighton	Plt Path-Veg	Derrick McDowell	Weed Sci/Coop. Ext.
Brian Fosdick	Coop. Ext.	Susan Sepenoski	Fruit & Veg. Sci.
Tom Gallagher	Coop. Ext.	Jane Utz	Coop. Ext.
Amanda Gevens	Coop. Ext.	Joshua Wagner	Plt Path-Veg
Greg Gorniok	Coop Ext	Kevin Willi	Plt Path-Veg

GREENHOUSE CROPS

EVALUATION OF INSECT GROWTH REGULATORS FOR CONTROL OF FUNGUS GNATS IN GREENHOUSE-GROWN POTTED IMPATIENS

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

Three rates of Adept (dimilin) were compared to Precision (fenoxycarb) and untreated plants for control of fungus gnats and phytotoxicity. Treatments were applied as surface drenches three times at monthly intervals to 4" potted impatiens 'Accent Red' which had previously been exposed to adult fungus gnats. Plants were individually caged with yellow sticky cards for part of the trial. Treatments were evaluated by counting both fungus gnat larvae under potato disks placed on the pot surface and emerged adults trapped on sticky cards.

Although no treatment effect could be measured based on larval counts, all three rates of Adept and Precision showed comparable levels of control based on adult fungus gnats trapped on sticky cards, compared with untreated pots. There was no phytotoxicity observed in any treatment.

EVALUATION OF INSECTICIDES FOR CONTROL OF MELON APHID ON GREENHOUSE-GROWN IMPATIENS

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

This trial evaluated several insecticides for control of melon aphid on impatiens 'Accent Red'. Twelve treatments were compared: Pirimor (pirimicarb) alone at two rates, Pirimor at one rate with two rates of Topcide (l-cyhalothrin), Topcide alone, three rates of acetamiprid, one rate of acetamiprid with fipronil, fipronil alone, Marathon (imidacloprid) and a water-only control. All treatments were applied as foliar sprays three times at weekly intervals, except for Marathon which was applied once as a drench.

Pirimor appeared to only suppress aphid populations, giving only fair control at best. Topcide alone or in combination with Pirimor provided good control of melon aphid, as did acetamiprid and fipronil when used alone or in combination or Marathon.

PHYTOTOXICITY OF INSECTICIDES TO GREENHOUSE-GROWN BEDDING PLANTS AND FOLIAGE PLANTS

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

Two trials were conducted to investigate phytotoxicity of insecticides to greenhouse crops. Single applications of nine treatments were applied to ten bedding plant cultivars (*Hedera algeriensis*, *Dianthus chinensis* 'Carmine Rose' & 'Purple Picotee', *Dracaena indivisa*, *Felicia amelloides*, *Impatiens wallerana* 'Accent White', *Tagetes patula* 'Orange Boy', *Melampodium paludosum* 'Showstar', *Mimulus hybrida* 'Mystic Mix', *Impatiens* hybrid 'Prepona' (red), *Zinnia elegans* 'Short Stuff Gold'), including two rates of Pinpoint 15G (topical application), two rates of Orthene 75S (pot drench), one rate of Orthene 75S as foliar spray, two rates of cyhexatin and two rates of pyrrol. A single application of two rates of cyhexatin were sprayed on eight cultivars of foliage plants (*Schefflera arboricola* 'Gold', *Codiaeum variegatum* 'Petra', *Dieffenbachia*

maculata 'Camille' & 'Compacta' (mix), *Dracaena marginata*, *Hedera helix* 'Ralf', *Hedera helix* 'Eva', *Syngonium podophyllum* 'White Butterfly', *Epipremnum aureum*). In both trials a set of untreated plants was left as a control. Plants were observed for three weeks after application for phytotoxicity.

Pinpoint damaged nearly all bedding plant cultivars at both rates, except for Algerian ivy. Orthene drenches caused a similar reaction, although damage was somewhat less. Orthene spray caused only mild to moderate injury to some cultivars and *Impatiens walleriana* foliage appeared tolerant. Cyhexatin caused injury to foliage of all bedding plants except for Dianthus, which was notably tolerant at both rates. Dianthus, however, was very sensitive to both rates of pyrrol. *Impatiens walleriana*, New Guinea impatiens and zinnia foliage showed slight injury at the highest rate of pyrrol only.

Young, tender growth of foliage plants was generally sensitive to applications of cyhexatin, with greater damage at the higher rate. Mature, hardened-off growth showed no injury at either rate. Dieffenbachia was the only plant notably unaffected by foliar sprays of cyhexatin applied at either rate.

RESPONSE OF IVY GERANIUM TO APPLICATIONS OF ADEPT

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

Ivy-leaved geraniums, cv. Wico 'Guimongol' cuttings were planted on February 2, 1997 in the Cornell Peat-lite Mix in 4-1/2 inch white, square plastic pots. Plants were grown at 62°F and fertilized with 300 PPM Peter's Excel 15-5-15 Cal-Mag at every irrigation. The purpose of this study was to determine the response of an ivy-leaved geranium to foliar and drench applications of Adept. There were twelve treatments in the study.

Nearly all foliar treatments were unsalable due to excessive Adept residue. No residuals were on the leaves of treatments receiving drench treatments. Fresh weight and dry weight decreased as concentrations of Adept increased. Phytotoxicity occurred as a marginal chlorosis in the mid- to most mature leaves then developed into a marginal necrosis in some of the treatments. As a result of this study it appears Adept is safe to use as a soil drench at 2 oz/100 gallons, at 1.5 fluid ounces per 4-1/2 inch container or less.

EFFECTS OF THREE DIFFERENT GERANIUM TYPES TO DRENCH APPLICATIONS OF ADEPT

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

On March 19, 1997 two varieties of well-rooted, three different types (ivy geranium, hybrid geranium, and cutting-type) of geraniums were planted in the standard Cornell Peat-lite Mix. They were grown at 62°F and fertilized at every watering at 300 PPM with Peter's Excel 15-5-15 Cal-Mag. The varieties used were: two ivy geraniums, two hybrid geraniums, and two cutting-type geraniums. All treatments were drenches at 1.5 fluid ounce/4-1/2 inch pot: 1) Control (untreated); 2) 1 oz/100 gallons; 3) 2 oz/100 gallons; 4) 4 oz/100 gallons; 5) 8 oz/100 gallons; and 6) 16 oz/100 gallons. Treatments were made ten days after planting on March 27, 1997 and again 20 days later on April 16, 1997.

Shortly after April 28 some very minor phytotoxicity symptoms started to develop on two treatments at the higher rates with all plants in all treatments of salable quality. Growers should expect no phyto-toxicity if used according to the manufacturer's label recommendations.

RESPONSE OF 63 VARIETIES OF GERANIUMS TO ADEPT DRENCHES

Investigators: R. Freeman And M. Borrayo
Location: Long Island Horticultural Research Laboratory

The objective of this study was to determine the responses of geraniums to drench applications of Adept, an insect growth regulator (IGR). Sixty-three different varieties of geraniums were taken as cuttings, stuck in pod paks (white polystyrene trays each with 25 cavities filled with a peat mix; cavities approximately 1-inch by 1-1/2 inches deep). There was one unrooted cutting placed in each cavity. They were then placed in a rooting atmosphere with in a plastic greenhouse held at 65-68°F for the duration of the study. All treatments were drenches, make 14 days following sticking and included: 1) Control - untreated; 2) 1 ounce Adept/100 gallons; 3) 2 ounces Adept/100 gallons; and 4) 4 ounces Adept/100 gallons. Data revealed there were no phytotoxicity symptoms displayed at anytime on any plant or plant part as a result of the treatments in either study. As a result of these applications it can be concluded Adept is a safe IGR to use on the 63 varieties grown in this study.

GARDEN PERFORMANCE AND EVALUATION OF 127 CULTIVARS OF CUT FLOWER LILIES -- STUDY 4

Investigators: R. Freeman And M. Macksel
Location: Mattituck

As reported earlier one hundred twenty-seven cultivars of multi-colored cut flower lilies were planted in three outdoor flower beds on July 27, 1994 in rows 8-inches apart, 5 bulbs planted 8 inches deep, 4 inches apart within the row, and two cultivars per row. The purpose of the study was to evaluate the growth and development of the lilies for garden performance during a four-year period. The data showed after four years in production the number of cultivars which had no regrowth from the bulbs were 19. The remaining 108 were productive with 35 cultivars with outstanding regrowth. There were 23 cultivars ending up with no horticultural value as there was no growth at all. The seven superior cultivars showing great promise for outstanding garden performance were: 'LA Hyb. Lily 87-2061-06'; 'London'; 'Hyb. Lily Nova Cento'; 'Hyb. Yellow Lily Polyanna'; 'Hyb. Oriental Lily Enchantment'; 'Hyb. Yellow Lily Adelina'; and 'Hyb. Ap. Red Lily Avignon'.

RESPONSE OF ORNAMENTAL FLOWERING CABBAGE TO APPLICATIONS OF BONZI

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

This study was conducted to determine the effects of foliar applications of Bonzi on the growth and development of ornamental cabbage, cv. 'Dynasty White Flowering Cabbage'. Plugs were planted on July 8, 1997 in 4-1/2 inch white plastic pots in the Cornell Peat-lite mix. There were five treatments, 4 plants per treatment and 4 replications. Treatments were: 1) Control (untreated); 2) Bonzi 10 PPM; 3) Bonzi 20 PPM; 4) Bonzi 30 PPM and 5) Bonzi 40 PPM. Foliar sprays were applied to runoff on July 15, 1997, seven days after planting.

Data showed plant height was reduced when Bonzi was applied. As concentrations increased the plant height was reduced with treatments 3, 4 and 5 being the same in height. Minor differences occurred with fresh weight with treatment 4 being the greatest. Dry weight was not affected by concentration. As a result of treatment there was no phytotoxicity displayed at anytime. All plants were salable. Bonzi is safe to use as a plant growth regulator on ornamental flowering cabbage. With the reduction of plant height, leaf size and plant diameter the attractiveness of the plant is enhanced and adds value.

RESPONSE OF ORNAMENTAL FLOWERING KALE TO APPLICATIONS OF BONZI

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

The response of foliar applications of Bonzi on ornamental flowering kale, cv. 'Sparrow Red Flowering Kale' was investigated. Plugs were planted on July 8, 1997 and grown in 4-1/2 inch plastic pots in the Cornell Peat-lite mix. There were five foliar application treatments: 1) Control (untreated); 2) Bonzi 10 PPM; 3) Bonzi 20 PPM; 4) Bonzi 30 PPM and 5) Bonzi 40 PPM. All foliar sprays were applied to runoff on July 15, 1997, seven days after planting early in the morning when the relative humidity was high.

Plant height was successively reduced as concentrations increased when compared to the Control. The shortest plants were in treatment 5. In treatments 3, 4 and 5 the fresh weights were less than the control with treatment 5 being the least in fresh weight. No differences occurred with the dry weights. Treated plants were high in quality, salable and no phytotoxicity symptoms were expressed at any time during the study as a result of the treatments. Bonzi is safe to use as a plant growth regulator on ornamental flowering kale. The reduction of plant height, leaf size and plant diameter improved the attractiveness and enhanced and added value.

EVALUATION OF TWO DIFFERENT FORMULATIONS OF B-NINE ON PANSY

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

The purpose of this study was to evaluate the effectiveness of B-Nine SP and B-Nine WSG, two different formulations on the growth and development of pansies. The cv. 'C. B. Yellow Pansy' plugs were planted in 4-1/2 inch plastic pots filled with the Cornell Peat-lite Mix on July 8, 1997. There were 7 treatments: 1) Control (untreated); 2) B-Nine SP 5000 PPM; 3) B-Nine SP 5000 PPM treated twice weekly; 4) B-Nine WSG 5000 PPM; 5) B-Nine WSG 5000 PPM treated twice weekly; 6) B-Nine WSG 3750 PPM + Cycocel 1500 PPM; and 7) Cycocel 1500 PPM. Treatments were made as foliar applications. The first treatments (Treatments 2-7) were made on July 15, 1997 with the second treatments (Treatments 3 and 5) made a week later on July 22, 1997. B-Nine treated plants had a darker green foliage when compared to the untreated plants. Data showed plant height was the same in all treatments and there were no observable differences in height between treatments. Plant diameter, fresh weight and dry weights were generally reduced with increasing concentrations. There was no phytotoxicity displayed at any time as a result of treatments.

RESPONSES OF PANSY WHEN IRRIGATED WITH RECYCLED NUTRIENT-CHARGED BONZI-TREATED WATER

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

A study was designed to determine if Bonzi would be an effective plant growth regulator for plants if included in the recycled Ebb and Flood irrigation system. The plant chosen for the study was 'C. B. Yellow Pansy'. On July 8, 1997 plugs were planted in the Cornell Peat-lite mix in 4-1/2 inch plastic pots with holes in the bottom of the pots. Bonzi was added to the recycled irrigation/ fertilizer water. Treatments were: 1) Control (untreated); 2) 0.001 PPM Bonzi; 3) 0.005 PPM Bonzi; 4) 0.01 PPM Bonzi; 5) 0.1 PPM Bonzi; and 6) 1 PPM Bonzi. Makeup solutions were added to the tanks as needed. In an ebb and flood system pansy is responsive to the inclusion of Bonzi in the irrigation/fertilizer water. As concentrations increased the plant height and plant diameter decreased. The most acceptable rates appears to be 0.01 to 0.1 PPM range. There were no phytotoxic symptoms appearing on any plant due to the use of Bonzi in the irrigation/fertilizer water.

AN EVALUATION OF SEVEN POINSETTIA CULTIVARS TREATED WITH PHYTON

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

After the 1996 production season seven poinsettia cultivars ('Peter Jacobsen's Petoy Red'; 'Eckespoint Jingle Bells 3'; 'Eckespoint Celebrate 2 Red'; 'Peter Jacobsen"s Pearl'; 'Peter Jacobsen's Peterstar Red'; 'Peter Jacobsen's Peterstar Pink'; and 'Peter Jacobsen's Peterstar Marble') were evaluated for their response to the application of Phyton, a fungicide commonly used for the control of powdery mildew and other diseases.

Treatments were: 1) Control (Untreated); 2) 1.5 ounces Phyton/gallon; 3) 3.5 ounces Phyton/gallon; and 4) 7.0 ounces Phyton/gallon. Treatments were made after the plants matured on January 4, 1997 and again one week later on January 11, 1997. At the time of treatment all plants were of high quality; developed good, full, shapely plants and were salable. The results of the study showed there was no phytotoxicity displayed in treatments 1, 2, or 3 at anytime. However, treatment 4 did display some phytotoxicity on the bract edges on all varieties.

POINSETTIAS AND THEIR RESPONSES TO THE PGR'S B-NINE, CYCOCEL AND BONZI USED SINGULARLY OR IN COMBINATION

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

The objective of this study was to determine the responses of poinsettias to foliar B-Nine, Cycocel and Bonzi applications when used singularly or in combination with each other. The variety 'Peter Jacobsen's Petoy Red' was planted on August 26, 1997, grown in 6-1/2 inch azalea pots, pinched on September 15, 1997 and treated with the growth regulator treatments on October 2, 1997 when the shoots were 1-2 inches long. There were 9 foliar treatments: 1) Control - untreated; 2) Bonzi 10 PPM; 3) Bonzi 20 PPM; 4) Bonzi 40 PPM; 5) B-Nine WSG 2500 PPM; 6) B-Nine WSG 1500 PPM + Cycocel 1500 PPM; 7) B-Nine WSG 2500 PPM + Bonzi 10 PPM; 8) B-Nine WSG 2500 PPM + 20 PPM; and 9) B-Nine WSG 2500 PPM + Bonzi 40 PPM.

Data showed plant heights were successively reduced with increasing concentrations of Bonzi. B-Nine WSG at 2500 PPM reduced plant height 13 percent when compared with the untreated control. Likewise, when B-Nine WSG was combined with Cycocel and when B-Nine WSG was combined with increasing amounts of Bonzi plant heights were decreased. Bract diameter and plant diameter were decreased as concentrations of the PGR's were increased. There was no phytotoxicity displayed on the plants as a result of treatments. All treated plants had leaves with a darker green color than untreated plants. It is safe to use combinations of B-Nine WSG with Cycocel or Bonzi to achieve plants with increased height reductions for plants with greater aesthetic values.

AN EVALUATION OF FIVE POINSETTIA CULTIVARS GROWN IN 1997

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

During the 1997 production season five poinsettia cultivars ('Peter Jacobsen's Petoy Red'; 'Eckespoint Jingle Bells 3'; 'Eckespoint Candy Cane'; 'Peter Jacobsen's Peterstar Red'; and 'Peter Jacobsen's Peterstar White') were evaluated. They were planted in 6-1/2 inch white plastic azalea pots on August 27, 1997. The plants were pinched once on September 14, 1996 and no growth regulators were used.

Plant height was greatest in 'Candy Cane' and the remainder all the same. Bract diameter was the same in all varieties with 'Petoy' and 'Peterstar White' slightly smaller (3-4 cm); and plant diameter largest in 'Candy Cane'. All plants were of high quality; developed good, full, shapely plants and were salable. These varieties have excellent commercial value and should be considered by growers in their production programs.

POINSETTIAS AND THEIR RESPONSES TO GROWTH REGULATORS IN EBB AND FLOOD SOLUTIONS

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

The objective of this study was to determine the responses of poinsettia 'Petoy' to the usage of Bonzi when used in the ebb and flood solution. It was planted on August 27, 1997 in the Peat-lite Mix in 4-1/2 inch pots and grown single-stem. Solution treatments (Bonzi was added to the fertilizer/water solutions) began on September 29th when the plants were well established . Treatments continued until November 1st. There were six treatments: 1) Control - untreated; 2) Bonzi 0.005 PPM; 3) Bonzi 0.001 PPM; 4) Bonzi 0.01 PPM; 5) Bonzi 0.1 PPM; and 6) Bonzi 1 PPM. The Bonzi was included in the fertilizer/water solution from September 29 to November 1.

Bonzi was effective in reducing plant height, plant diameter, leaf blade length, leaf width, petiole length, bract diameter and enhancing plant appearance. Reductions became progressively greater as the concentrations increased. No phytotoxicity symptoms resulted with the usage of Bonzi. Treatments 4 and 5 were the commercially acceptable ones. Bonzi can be used in a closed loop or zero run-off system such as ebb and flood.

IMPACT OF FIVE PINCHING DATES ON THE GROWTH AND DEVELOPMENT OF POINSETTIA

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

Poinsettias of the cultivar 'Petoy Red' were planted on August 27, 1997 in 6-1/2 inch azalea pots in the Cornell Peat-lite Mix and grown in a commercial manner.

On five different dates the plants were pinched to determine their responses to pinching other than the normal September 15th pinching date. Treatments were: 1) Control - no pinch; 2) September 10; 3) September 15; 4) September 20; 5) September 25; and 6) September 30. No Plant Growth Regulators were used in this study. Data revealed the later the pinching date the shorter the plants became; diameter of plants decreased; and bract diameter decreased. Additionally, it was demonstrated the number of bracts per plant increased if they were pinched when contrasted to plants not pinched. The non-pinched plants had the fewest number of bracts. Interestingly, the greatest number of bracts per plant was on the plants with the standard pinching date of September 15th (commonly used on Long Island). This study shows the desired pinching date of September 15th pinching date was the most promising and yielded the finest quality plants.

SUSCEPTIBILITY OF GERANIUMS TO THRIPS

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

Thrips continue to be a common problem in many floricultural crops. In a study where 63 geranium cultivars were propagated and grown it was observed thrips damage to the foliage was very evident on some varieties and others not. Therefore, at the termination of the study all the geranium varieties were evaluated to determine the visual intensity of damage caused by thrips. The evaluation system used was as follows: 1) very severe damage; 2) severe damage; 3) minimal damage; and 4) no detectable damage.

Results showed: in category 1 there were 5 ivy and 1 zonal; category 2 there were 4 ivy and 4 zonals; category 3 there were 7 ivy and 6 zonals; and in category 4 there were 5 ivy and 31 zonals. Growers carefully studying this information can choose varieties of ivy and zonal geraniums which will be relatively free of thrips populations and observable damage.

EFFECTS ON TOMATOES WHEN IRRIGATED WITH RECYCLED NUTRIENT CHARGED BONZI-TREATED WATER

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

A study was designed to determine if Bonzi would be an effective plant growth regulator for tomato if included in the recycled Ebb and Flood irrigation system. On May 9, 1997 'Early Girl' tomato plants were planted in 4-1/2 inch plastic pots with drainage holes in the bottom of the pots. Bonzi was added to the irrigation/ fertilizer water which began on May 10th. Treatments were: 1) Control (untreated); 2) 0.001 PPM Bonzi; 3) 0.005 PPM Bonzi; 4) 0.01 PPM Bonzi; 5) 0.1 PPM Bonzi; and 6) 1 PPM Bonzi.

In an ebb and flood system tomatoes were found to be responsive to the inclusion of Bonzi in the irrigation/fertilizer water. The most acceptable rates appears to be 0.1 to 1 PPM range. There were no phytotoxic symptoms appearing on any plant due to the use of Bonzi. Treated plants were darker green in color with differences in plant heights appearing two weeks after treatments began.

THE INFLUENCE OF TWO DIFFERENT MIXES ON THE GROWTH AND DEVELOPMENT OF GREENHOUSE-GROWN ROSES

Investigator: R. Freeman
Location: Long Island Horticultural Research Laboratory

Rose plants, cv. 'Raspberry Ice', were planted in two different mixes, the Cornell Peat-lite Mix and a Rose Mix (40% soil, 20% perlite and 20% Poultry Peat and 20% Composted Pinebark) on April 4, 1997. The greenhouse temperatures were 62-64° F when controllable. Standard commercial production procedures were used to grow the crop.

Results showed the Peat-lite mix was superior when producing this cultivar. Plants in this mix had 200.3% more flowering stems per plant and a 9.3% greater stem length than those grown in the 'Rose Mix'. Nutritional data showed the nitrate, ammonium and phosphorous levels were approximately the same in either mix. However, the potassium and calcium levels were greater and displayed more retention of these nutrients in the 'Rose Mix'. There were no corrective measures taken to adjust the nutrient levels during the production period. There were no phytotoxicity symptoms displayed at any time due to the mixes used or fertilizers used.

PROBLEM DIAGNOSIS FOR GREENHOUSE FLOWER CROPS, 1997

Investigators: M. Daughtrey, D. Gilrein, M. Macksel and N. Shishkoff
Location: Long Island Horticultural Research Laboratory

There were 281 greenhouse flower crop samples submitted for diagnosis in 1997. Geranium samples were most numerous (69), followed by impatiens (30) and poinsettia (23). Only a few cases of bacterial blight of geranium (*Xanthomonas campestris* pv. *pelargonii*) were seen in 1997; the predominant problem was Pythium root rot. On impatiens, Pseudomonas leaf spots were seen early in the spring, followed by Alternaria leaf spot in late spring and summer. Outdoors, as mild weather extended into the fall, impatiens were often disfigured by Alternaria leaf spots. Botrytis, Rhizoctonia and Sclerotinia stem cankers were seen on poinsettia, and Pythium was a common problem. *Pythium aphanidermatum* was especially troublesome for some poinsettia growers. In one case, *Phytophthora parasitica* caused poinsettia losses during propagation. Fungus gnat larval feeding was frequently the cause of death for young poinsettias and geraniums this season. Fourteen pansy samples were received this year: the most severe pansy problems detected were a crown rot caused by *Phytophthora parasitica* and Cercospora leaf spot. Cyclamen crops once again were badly affected by Fusarium wilt. Impatiens necrotic spot tospovirus (INSV) continues to be a major problem—symptoms were seen this year on begonia, impatiens, New Guinea impatiens, gloxinia, browallia, coleus, petunia and lobelia. Phytophthora root rots occurred on dracaena seedlings, English ivy, peperomia and sage. Both *Thielaviopsis* and *Phytophthora parasitica* root rots were found on fuchsia, and Pythium and Rhizoctonia root rots were detected on a wide range of crops, including Easter lily.

EFFECT OF CULTURAL FACTORS ON POINSETTIA ROOT ROT, 1997

Investigators: M. Daughtrey, T. Weiler, R. Freeman and M. Macksel
Location: Long Island Horticultural Research Laboratory

A trial was designed to test the effects of fertilizer and fungicide treatments on Pythium susceptibility. 'Freedom Red' cuttings were planted 3/27/97 in a 2 X 2 X 2 X 2 factorial design. There were 6 single-plant reps of each treatment for each of 3 harvest dates. Fertilizer treatments were on a constant-liquid-feed basis at 300ppm (higher than recommended for Freedom). 20-10-20 provided low ammonium nitrogen (39% N as NH4), in contrast to the high-ammonium 24-8-16 (60% N as NH4). The

two fungicide treatments were "no fungicide" vs. Banrot 40 W at 10 oz/100 gal, applied at a dose of 1/2 pint per pot on 3/27, 4/24 and 5/21. The two Electra treatments were no Electra vs. Electra used at 1 tsp per pot, applied at pinching (4/29). The two fungus inoculation treatments were "no Pythium" vs. adding 1 tsp per pot of a V8 juice/vermiculite inoculum, set under the cuttings at planting. Nitrogen accumulated excessively (>5% N) in foliage from the overly-high fertilization rate. Banrot was effective at controlling root rot, but was also associated with significantly increased NH4 levels, increased pH, and reduced EC values in media on 6/10. With the high-NH4 fertilizer only, Banrot treatment thus resulted in stunted plants. Electra topdress supplied small quantities of some nutrients, but had no significant effect on root rot. Growers should pay careful attention to root-zone temperatures in the fall, as ammonium build-up is increased at low temperature as well as by the fungicides used to prevent root rot, such as the Banrot used in this trial.

This project was supported by the Friends of Long Island Horticulture.

EFFECT OF NITROGEN SOURCE AND BANROT DRENCH ON POINSETTIA ROOT ROT

Investigators: M. Daughtrey, T. Weiler, R. Freeman and M. Macksel
Location: Long Island Horticultural Research Laboratory

As a follow-up to a spring study on cultural factors' impact on Pythium root rot, a second trial was designed to test the effects of fertilizer and fungicide treatments on Pythium susceptibility under typical fall finishing conditions. 'Freedom Red' cuttings were planted 8/12/97 in a 2 X 2 X 2 factorial design. There were 6 single-plant replications of each treatment for each of 3 harvest dates. Fertilizer treatments were on a constant-liquid-feed basis at 200ppm. 20-10-20 provided low ammonium nitrogen (39% N as NH4), in contrast to the high-ammonium 24-8-16 (60% N as NH4). The two fungicide treatments were "no fungicide" vs. Banrot 40 W at 10 oz/100 gal, applied at a dose of 1/2 pint per pot on 8/12 and 9/15. The two fungus inoculation treatments were "no Pythium" vs. adding 1 tsp per pot of a V8 juice/vermiculite inoculum, set under the cuttings at planting. Poinsettias not inoculated with Pythium were harvested 9/10, 10/2 and 10/28 for soil and foliar analysis. There were no significant differences in fresh or dry weight values in poinsettias given the different fungicide/fertilizer treatments (Fisher's Protected LSD, P=0.05). Root quality ratings made 10/28 indicated that Banrot drenches significantly improved root quality for the Pythium-inoculated plants fertilized with 20-10-20. For all Pythium-inoculated plants, the root quality was excellent if Banrot drenches were applied (mean ratings of 1.1-1.2, on a scale of 1-4, with 1=uniformly white roots, 2=some root rot, 3=primarily rotted roots, with some roots still white, 4=uniformly rotted roots). Inoculated controls had ratings of 2.8 for plants fertilized with 20-10-20, and 1.7 for plants fertilized with 24-8-16. Foliar and soil analysis information was not yet available at the time this report was prepared. By reducing the level of fertilizer applied, the overall root health was much improved compared to that seen at 300 ppm in the spring, and none of the poinsettias were stunted.

This project was supported by the Friends of Long Island Horticulture.

EVALUATING BIOLOGICAL AND CHEMICAL CONTROLS FOR EFFECTIVENESS AGAINST BOTRYTIS BLIGHT OF GERANIUM

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

In this trial we assessed the benefit of two experimental biologically-based materials, TopShield (containing a fungus, *Trichoderman harzianum* Rifai strain KRL-AG-2) and Leone (containing the bacterium, *Burkholderia*) for control of Botrytis

in contrast to Chipco 26019 and Phyton 27, which are both registered for control of Botrytis on greenhouse flower crops. Rooted cuttings of 'Yours Truly' and seedlings of 'White Orbit' geranium were grown in 4 1/2" pots and fertilized with 300 ppm Peter's 20-10-20 at each watering. Spray treatments were applied to drip with a hand-held CO_2 sprayer at 25 p.s.i. on 5/7, 5/14 and 5/21/97; treatments were applied to 5 replications of 1 plant of each cultivar, set under a plastic tent on the greenhouse bench. Beginning 24 hrs after the first spray, several times per week, Botrytis spores from a culture plate were blown onto lightly misted geraniums at the end of the afternoon, before tenting them for the night. Plants were rated for the no. of leaves with Botrytis lesions on 5/14, 5/21 and 5/28. Infection was fairly light (only 4 leaves/plant for 'Yours Truly' and only 1.8 for 'White Orbit' in untreated controls). There were no significant differences between treatments for 'White Orbit'. For 'Yours Truly', the no. of infected leaves was significantly reduced by Chipco 26019 50WP at 2 lb/100, TopShield 1.15WP at 100 oz/100 gal, and by Leone when 2 passes were made with a 1% liquid formulation. Symptom reductions were seen in Phyton 27 21.3L at 15 oz/100gal, Root Shield (1.15WP drench) followed by TopShield sprays, Chipco 26019 + TopShield tank mix and 1% Leone treatments, but these reductions were not significant (Fisher's Protected LSD, p=0.05). The only phytotoxicity noted was a tan corkiness along some of the leaf veins of 'Yours Truly' treated with Phyton 27, visible one week after the second application. The association of this injury with multiple Phyton 27 treatments was confirmed in a follow-up study.

EVALUATING PHYTON 27 FOR ITS POTENTIAL TO CONTROL THIELAVIOPSIS ROOT ROT OF PANSY

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

In order to test the bactericide/fungicide Phyton 27 for its potential to discourage infection by *Thielaviopsis basicola*, the fungus causing black root rot of pansies, various treatments were made to 4 replications of a blue pansy cultivar in 4-cell packs of Cornell peat-lite mix. Different spray and drench treatments with Phyton 27 21.36L were compared to treatments with Terraguard 50WP and Medallion 50WP, as well as inoculated and uninoculated controls. Pre-treatments with Phyton 27 were made one week before transplanting and inoculation, while pansies were still in their original plug tray. All but the uninoculated control plugs were inoculated 5/15 by dipping them into a suspension of *Thielaviopsis* spores at the time of transplant (note that this provided very heavy inoculum pressure). The trial was ended on 6/9, when symptoms were advanced in many treatments. Fresh and dry wt. data were collected as a measure of inhibition of growth due to root rot (pansies were harvested at the soil line). Only the Terraguard drench (4 oz/100 gal at transplant) allowed reasonably vigorous pansy development, but fresh and dry weights were reduced significantly compared to uninoculated controls even in this treatment (Fisher's Protected LSD, p=0.05). Medallion 50WP (2 oz/100 gal at transplant) gave some symptom reduction, but was less effective than Terraguard. Phyton 27 was not effective at reducing Thielaviopsis symptoms when drenched 1 wk before inoculation at 35 oz/100 gal; when drenched at transplant and at 14-day intervals at 20 or 35 oz/100 gal; or when sprayed 1 wk before inoculation or at transplant and at 14-day intervals thereafter at 20 oz/100 gal. A combination treatment of Medallion at 2 oz plus Phyton 27 at 35 oz/100 gal (drench to plug tray, at planting, and every 14 days thereafter) was also ineffective. In this trial, Phyton 27 treatments did not show any benefit for Thielaviopsis control.

EVALUATING THE SENSITIVITY OF VARIOUS BEDDING AND POTTED PLANTS TO DRENCHES OF THE FUNGICIDE MEDALLION

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Medallion is a new Rhizoctonia-controlling fungicide with the active ingredient fludioxonil. The potential of Medallion to cause injury to petunia 'Carpet Blue Star', begonia 'Prelude Pink', pothos, peperomia and holiday cactus (*Schlumbergera* sp.) was assessed on plants transplanted in mid-April. At the time of the first treatment, begonias had 4-6 leaves, petunias were 2-3" tall with some flower buds showing, and the foliage plants were rooted and actively growing. There were 7 replications of each treatment: drenches with Medallion 50WP at 1, 2 or 4 oz/100 gal were made on 4/29 and 5/26; non-treated plants served as controls. No symptoms of phytotoxicity were observed on the plants in the trial. The pothos drenched with Medallion at 1 and 4 oz rates had higher dry weights than those left untreated (Fisher's Protected LSD, P=0.05), suggesting that there may have been some Rhizoctonia infection in this crop. None of the other crops showed significant growth differences when treated with Medallion.

EVALUATING MEDALLION PLUS SUBDUE MAXX FOR PYTHIUM AND RHIZOCTONIA CONTROL IN SNAPDRAGONS AND GERANIUMS

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Medallion is a new *Rhizoctonia*-controlling fungicide with the active ingredient fludioxonil. We evaluated it this season in combination with the new Pythium-controlling fungicide, Subdue MAXX (mefenoxam) for the ability to control a combination of *Pythium* and *Rhizoctonia* on snapdragon 'Flash with Lavendar Bicolor' and geranium 'White Orbit'. There were 7 replications of each treatment; drenches were made on 4/16 and 5/8 at 1 pint/sq ft. Uninoculated plants as well as Pythium-inoculated or Rhizoctonia-inoculated plants served as controls. Each plant treated with Medallion + Subdue MAXX was inoculated with an agar disc from a culture of *Pythium aphanidermatum* and also with a disc of *Rhizoctonia solani*, by placing the inoculum into the media at opposite corners of the pack compartment. Plants were fertilized with Peters 20-10-20 at 150 ppm as needed, until they were harvested at the soil line on 5/19. By 5/19, at least half of the geraniums in the *Rhizoctonia*-inoculated controls showed wilting, yellowing leaves, blackened petioles, basal stem cankers and stunting; snapdragons did not develop symptoms of Rhizoctonia infection in the inoculated controls. Medallion 50WP at 1 oz/100 gal (alone) gave good control of *Rhizoctonia* in geraniums (Fisher's Protected LSD, P=0.05), with some reduction in fresh and dry wts. Subdue MAXX 2MC (alone) at 0.5 oz also reduced geranium and snapdragon fresh and dry wts, but *Pythium* symptoms did not develop in this trial so it was not possible to observe symptom reduction in this treatment. Snapdragons given Subdue MAXX alone and inoculated with both *Rhizoctonia* and *Pythium* showed cankers, root rot and mortality to a much greater extent than seen in either inoculated control. The combination of Medallion 50WP at 1 oz/100 gal + Subdue MAXX 2MC at 0.5 oz/100 gal resulted in sharply reduced fresh and dry wt. values in geranium (no different from plants inoculated with Rhizoctonia and not treated); the combination treatment did not, however, reduce growth of snapdragon. Further studies to evaluate the appropriate rates of these materials, alone and in combination, are indicated. Growers should use caution with Subdue MAXX treatment, as this new fungicide should be used at lower rates than the familiar Subdue 2E.

FLUDIOXONIL PLUS MEFENOXAM IN EXPERIMENTAL GRANULAR FORMULATIONS FOR PYTHIUM AND RHIZOCTONIA CONTROL

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Granular fungicide treatments (2G and 3G) combining the active ingredient of Medallion 50W for Rhizoctonia control and that of Subdue MAXX 2MC for Pythium control were pre-incorporated into ProMix BX at 16 oz/cu yd. Impatiens 'Dazzler Red', snapdragon 'Flash with Lavendar Bicolor', petunia 'Carpet Blue Star' and marigold 'Perfect Orange' were transplanted from plugs to packs filled with treated or untreated mix on 4/16. Plants in untreated mix inoculated with either *Pythium* or *Rhizoctonia*, served as additional controls. There were a total of 6 treatments, each replicated 6 times. For each plant to be inoculated, an agar disc from a culture of *Pythium aphanidermatum* and/or *Rhizoctonia solani* was placed into the mix at the corner of the pack compartment. Plants were fertilized with Peters 20-10-20 at 150 ppm at each watering until harvested at the soil line on 5/7. Pythium symptoms did not develop in inoculated controls in this trial, either due to the cool spring temperatures or because this geranium isolate was not pathogenic to the bedding plants in the trial. *Rhizoctonia*, however, caused symptoms on impatiens and snapdragon, and mortality on petunia. On impatiens, the fungicide combinations did not decrease root disease symptoms on plants inoculated with both fungi (Fisher's Protected LSD, P=0.05), and both formulations tested sharply reduced growth. For petunias, there was some mortality in all treatments where *Rhizoctonia* was inoculated, but mortality was highest in the 3G combination treatment. For snapdragon, the 2G and 3G granular treatments were intermediate between inoculated and uninoculated controls in root rot, wilt, cankers and mortality, indicating some, but insufficient, control of root disease. For marigolds, symptoms did not develop for either disease, and growth reduction in granular treatments, although significant, was not as notable as on other species. The granular formulations tested appear to be causing some root stress, particularly on impatiens and petunia, which is conflicting with the ability of the ingredients to control the root rot fungi.

ASSESSMENT OF DIFFERENT MEFENOXAM FORMULATIONS FOR PYTHIUM CONTROL ON GERANIUMS AND SNAPDRAGONS

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Granular, wettable powder and microencapsulated mefenoxam formulations were evaluated for their ability to control Pythium root rot of geraniums and snapdragons. Plugs of geranium 'White Orbit' and snapdragon 'Flash with Lavendar Bicolor' were transplanted into packs on 4/17. For plants in two treatments, two rates of a granular formulation of CGA 329351 (4 oz and 8 oz/cu yd) were pre-incorporated into the mix. All but the uninoculated control plants' compartments were inoculated with a disc from an agar culture of *Pythium aphanidermatum*, placed at one corner. Drench treatments were made at 1 pint/sq ft, on 4/17, using the 2MC at 0.5 and 1.0 oz/100 gal and 45WP at 0.275 and 0.55 oz/100 gal. There were 5 replications of the 8 treatments in this trial. Plants were fertilized with Peter's 20-10-20 at 150 ppm at each watering. The snapdragons did not appear to be susceptible to the Pythium isolate used in this trial, or else environmental conditions did not encourage infection for this species. The geraniums also did not show any fresh wt. reduction from addition of *Pythium*. Geraniums were harvested at the soil line on 5/12 to compare growth effects of the treatments. There were no negative growth effects from any mefenoxam treatment. For the 2MC formulation (now being sold as Subdue MAXX), the lower rate tested (0.5 oz/100 gal)was preferable (significantly higher fresh wt.—Fisher's Protected LSD, P=0.05). A similar study under conditions of higher disease pressure would be desirable.

EVALUATING THE SAFETY OF BANNER MAXX TO VARIOUS BEDDING AND POTTED PLANTS

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

The fungicide Banner MAXX (propiconazole) is registered for use on ornamentals grown outdoors, where it is used for management of powdery mildew and rust diseases. This trial tested the safety of Banner MAXX MC at 2, 4 and 6 oz/100 gal and Strike 25 TOF at 4 oz/100 gal to impatiens, pansy, geranium 'Pinto Red', poinsettia 'Freedom Red', syngonium and dracaena. Geraniums, impatiens and pansies were treated at the time of transplant into packs containing ProMix BX, on 4/16/97. Other plants were treated at transplant to 5 1/2" pots. There were 6 replications for each treatment. Impatiens and pansies were harvested on 5/27 because the crops were mature. Final observations were also made on poinsettia at this time. Geraniums, syngonium and dracaena were given a second treatment on 5/27. Plants were fertilized with 20-10-20 at 150 ppm twice a week during the trial. None of the plants sprayed with one or two Banner applications showed any yellowing, scorching, or conspicuous stunting as a result of treatment. There were no significant differences in dry wts of pansy, impatiens, syngonium or dracaena in the different treatments (Fisher's Protected LSD, p=0.05). Poinsettias were rated visually only, and showed no indication of sensitivity to treatments. Geranium data showed earlier flowering and larger plants in all Banner treatments; this benefit was also seen with the Strike treatment.

EFFECT OF FUNGICIDE TREATMENTS ON FUSARIUM WILT OF CYCLAMEN

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

This trial was initiated primarily to assess the ability of Terraguard 50WP (triflumizole) to combat the vascular wilt disease caused by *Fusarium oxysporum* f. sp. *cyclaminis* on cyclamen. Terraguard treatments included 4 and 8 oz/100 gal sprays or Terraguard + Silwet sprays (4 oz of each/100 gal) at 2 wk intervals; Silwet alone at 4 oz/100 gal; and Terraguard drenches at 4 and 8 oz/100 gal, monthly. Other treatments included: Medallion 50WP (fludioxonil) drench at 4 oz/100 gal; RootShield (*Trichoderma harzianum* T-22) drench (8 oz/100 gal) plus granular incorporation (1.5 lb/cu yd) at planting; and cyclamen grown in straight coconut coir medium (all other plants were grown in Cornell peat-lite mix). Thiophanate-methyl treatments (using Cleary's 3336 50WP at 16 oz/100 gal as a drench every 21 days, or Cleary's 3336 drench once at planting followed by a spray at 16 oz/100 gal every 2 wks) were used as industry standards. There were 5 replications of 3 plants for each treatment, arranged in a randomized complete block. All treatments were made beginning 8/21 to cyclamen 'Sierra White' transplanted from plugs on 8/20. Inoculum was supplied to all but the uninoculated control plants on 8/28, by adding (to each 6" azalea pot) a plug of mycelium from an agar culture of a 1997 isolate of the pathogen. Cyclamen were fertilized with 20-10-20 at 200 ppm. Plants were given a water stress event 9/15-9/26 to facilitate disease expression. Terraguard-drenched plants were the first to show disease symptoms; coconut coir-grown plants grew more slowly and showed delayed symptom onset compared to other treatments. Final mortality data collected on 12/16 showed that there were no dead plants in the uninoculated controls, and only 1 out of 5 plants (20%) were dead in the inoculated controls. There was higher mortality in several treatments (Fisher's Protected LSD, p=0.05) than in the inoculated controls: Silwet alone (67%), Terraguard drenches (73%), Cleary's drenches (87%), and coco fiber treatments (93%) all resulted in an enhanced incidence of wilt disease symptoms. The percent mortality was not significantly different from that in the inoculated controls for the other treatments, indicating that they were ineffective at disease control under the demanding conditions of this experiment, but did not

increase disease expression. These results indicate that the presence of the inoculum alone is not enough to cause symptoms; the higher rates of mortality seen in some treatments might be interpreted as evidence that the root system was in some way stressed in those treatments, facilitating the entry of the Fusarium. Increased soluble salts levels might have been a factor. Further studies are indicated, to explore management strategies that would focus on avoidance of root stress.

EVALUATION OF TREATMENTS FOR CONTROL OF POWDERY MILDEW ON POINSETTIA

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

In fall, 1997, eleven spray treatments (some at 1 wk and some at 2 wk intervals) were assessed for their ability to reduce the incidence of powdery mildew infections on poinsettia. Rooted cuttings of 'Freedom Red' were transplanted to 6" pots on 8/6/97 and fertilized with 20-10-20 on a constant-liquid-feed basis at 200ppm. The first treatments were begun on 9/10 with eKsPunge (monopotassium phosphate); other treatments were started 10/14. Inoculum was added to the greenhouse on 10/15, by introducing 4 poinsettias covered with powdery mildew. There were 4 replications of 3 plants for each treatment, arranged in a randomized complete block design. An exact count was made of the number of mildew colonies on four marked upper leaves on each plant on 11/5, 11/19 and 12/17, and the number of colonies on 4 marked bracts per plant were counted on 12/2, 12/9 and 12/17. On leaves, all of the treatments gave significant control of powdery mildew (Fisher's Protected LSD, P=0.05) in comparison to controls, which had 7.2 colonies/leaf on 12/17. Weekly sprays with eKsPunge + Latron or Latron alone gave significant control on foliage, but were ineffective on bracts (eKsPunge + Latron B-1956 spreader-sticker was more effective on foliage than Latron alone). On bracts, the best control (no colonies) was seen in Terraguard (triflumizole) treatments at the 12/17 rating, both Terraguard 50 WP at 8 oz/100 gal every 2 wks, and the same fungicide with the addition of Latron B-1956 at 1.25ml/L. The untreated controls, in contrast, had a mean of 26.5 colonies/bract on 12/17. A strobilurin fungicide, BASF 490 02F, was also tested at 2 wk intervals with and without the addition of Latron B-1956, and in both cases it gave control on bracts that was statistically similar to the Terraguard, although a few scattered colonies were visible. There was no apparent phytotoxicity or enhancement of control from the addition of the spreader-sticker to either fungicide. Weekly treatment with the experimental fungicides WAC-72 and WAC-73 at 5 lbs/100 gal was also effective at controlling disease on bracts; these materials performed similarly to the BASF 490 02F. By November, leaf and bract tip burn (1/4" back from tip) was observed in both WAC-72 and WAC-73 treatments. Treatment with a TopShield (*Trichoderma*) formulation at 1/8 oz/gal gave bract control that was not as good as Terraguard, but significantly better than the untreated controls or the Latron.

TRIAL OF ROOT ROT FUNGICIDE COMBINATION DRENCHES ON POINSETTIA

Investigators: M. Daughtrey, R. Freeman and M. Macksel
Location: Long Island Horticultural Research Laboratory

Recent concerns about the possibility of fungicide insensitivity in root rot fungi affecting flower crops have led to the question of whether fungicides with different modes of action might be combined, to reduce the chance that a drench will be ineffective. Because there is increased likelihood of root stress or injury with increased dosage of chemical fungicides, this idea needs thorough testing before industry use. This season we tested Aliette 80WDG at 64 oz/100 gal (spray), and drenches of Banrot 40WP at 6 and 12 oz/100 gal, Subdue MAXX 2MC at 0.5 oz and 1.0 oz/100 gal, as well as combinations of Subdue MAXX with Aliette spray and

Banrot drenches. The biocontrol RootShield (1.5lb/cu yd incorporated granules) was also tested alone and in combination with Aliette sprays. Pinsettias that were not drenched served as a control. Treatments were applied monthly, except when Subdue MAXX was used at a 1.0 oz rate, in which case treatments were made at a 6 wk interval. 'Freedom Red' poinsettia cuttings were transplanted into 6" azalea pots of Cornell Poinsettia Mix and given their first treatment on 9/3/97. Drenches were applied at a rate of 1/2 pint/pot. There were 4 replications of 3 uninoculated plants per treatment in a randomized complete block design. Poinsettias were watered in with a 150 ppm solution of 20-10-20 and subsequently fertilized with 15-5-25 at 200 ppm on a constant liquid feed basis. Plant height was recorded and root health was assessed at the end of the trial, on 11/25. Most plants had a root rating near 2.0, using a 1-4 scale in which 1=white healthy roots and 2=mostly white roots with some root discoloration. Plant height data indicated that poinsettias drenched with a single fungicide and those given Aliette spray + Subdue MAXX drench combinations were no different in height from controls (Fisher's Protected LSD, p=0.05). Slight reduction in height (that would have no negative effect on marketability) was seen with all Banrot + Subdue MAXX combinations, and with Root Shield granular incorporation with and without Aliette spray. Although statistically significant, the mean decrease in height with some of the treatments never was greater than 3 cm, so the stunting was not of any practical significance. Further studies, including inoculation with sensitive and insensitive isolates of *Pythium* spp., are needed to explore this topic further.

CONTROL OF POWDERY MILDEW ON NEW GUINEA IMPATIENS

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

A new powdery mildew disease, previously seen only rarely, was more common on New Guinea impatiens crops in early 1997. The symptoms are a white coating on the leaves and stems; the disease causes leaf drop in the most severe instances, but may be overlooked in its early stages because the mildew forms a thin coating which is not very white. This fungus appears to be a *Sphaerotheca* sp., but it has not been identified to the species level. Because this disease has only recently become important in New Guinea impatiens crops, powdery mildew fungicide labels are generally not written to allow use on impatiens. This spring we trialed a variety of fungicides to see which would be effective against this disease. Rooted cuttings of 'Anaea' were planted 5/9/97 into Cornell peat-lite mix in 4 1/2" pots. There were 3 plants per replication for 4 replications in a randomized complete block design. Fungicide treatments were made weekly beginning 5/21; inoculum was introduced on infected plants on 5/22. Plants were fertilized with Peter's 20-10-20 at 150 ppm on a constant liquid feed basis using trickle-tube irrigation. Powdery mildew infection was obvious only in the untreated controls on 7/31 (possibly because of the wide pot spacing, which would have reduced humidity around the plant canopies). Thus, 5 leaves were randomly selected from mid-canopy from one plant in each replication for each treatment, and examined microscopically to evaluate the percent leaf coverage by powdery mildew. In the untreated plants, 75% of the leaves were infected, and all colonies were sporulating. The powdery mildew was well controlled by all treatments (leaf coverage was 0-5% in treatments, whereas controls showed as much as 65% leaf coverage). No colonies were observed on sampled leaves treated with Strike 25TOF (4 oz/100 gal), SunSpray 6E horticultural oil (0.5%), or Dithane 75%T/O (1.5 lb/100 gal). Phyton 27 21.3% (20 oz/100 gal) treatment reduced leaf coverage to 1-5%. A few non-sporulating colonies were seen on one leaf treated with Terraguard 50WP at 4 oz/100 gal. TopShield 1.15WP treatment at 1 oz/100 gal resulted in a few non-sporulating colonies, and only 20% of the leaves showed any infection.

CONTROL OF POWDERY MILDEW ON MINIATURE ROSES WITH MONOPOTASSIUM PHOSPHATE

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

The purpose of this trial was to compare powdery mildew control on miniature rose with a monopotassium phosphate product, eKsPunge, with and without spreader-sticker, in contrast to Terraguard 50W as an industry standard. 'Little Crimson var. Savacrim' were transplanted to 6 1/2" azalea pots of Cornell peat-lite mix on 7/24; 'Fame Parade var. Povtory' was added to the trial on 8/5/97, after the first spray treatment. Powdery mildew was present from the beginning of the trial. There were 5 replications of 3 plants per treatment in a randomized complete block design, including a non-sprayed control. Roses were fertilized with Peter's 20-10-20 at 150 ppm once/wk. A visual estimate of the percent of the upper leaf surface covered by powdery mildew was made for each plant on 8/11, 8/18 and 8/26. 'Little Crimson' was especially susceptible to powdery mildew. On 8/11, only the eKsPunge + Latron B-1956 used at a 7-day interval and Terraguard 50W at 4 oz/100 gal at 7 or 14 days were significantly better than untreated controls (Fisher's Protected LSD, p-0.05). By the end of the trial (8/26), Terraguard at a 14-day interval was no longer significantly different from the control on this cultivar. With 'Fame Parade', disease development was slower. By the final rating, 7-day treatments of Latron, eKsPunge + Latron and Terraguard were all providing significant reduction of disease, but the level of control was acceptable only with Terraguard treatment. Latron addition to eKsPunge improved its control significantly in 7-day treatments, but this combination was ineffective at 14-day intervals. Terraguard at a 7-day interval was superior to the other treatments on 'Fame Parade', allowing only 4.1% powdery mildew coverage in contrast to 83% coverage in the controls.

CONTROL OF POWDERY MILDEW ON MINIATURE ROSES WITH THE EXPERIMENTAL FUNGICIDE WAC-72

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

An experimental fungicide, WAC-72, was tested for its ability to control powdery mildew at 7 and 14-day intervals, as well as in programs with Cleary's 3336 50WP and Pipron 84.8EC (the latter with Latron B-1956 as a spreader-sticker). Mini-roses were planted in Cornell peat-lite mix in 6 1/2" azalea pots on 7/24/97. There were 5 replications of 3 plants ('Scarlet Rosamini' var. RUIrupo) for each treatment, arranged in a randomized complete block design. Spray treatments were begun on 8/5, after powdery mildew was observed in the plot on 8/4. Powdery mildew was rated on 8/11, 8/18 and 8/26, estimating the percent coverage of upper leaf surfaces for each plant. At the final rating, the most effective treatments were Pipron at 8 oz + Latron B-1956 at 2 oz/100 gal and the combination of these two materials with Cleary's 3336 at 16 oz/100 gal. In these treatments, powdery mildew coverage was less than 6%, in contrast to 92% coverage in the untreated controls. Some significant reduction of mildew (Fisher's Protected LSD, p=0.05) was achieved with all treatments, but in addition to the treatments previously mentioned, only WAC-72 at 2.5 lbs/100 + Cleary's 3336 at 16 oz/100 at 7- or 14-day intervals held the mildew to less than 20% coverage at the final rating. WAC-72 used alone at 2.5 lbs/100 gal every 7 days was significantly more effective than the same treatment at 14-day intervals, resulting in 28 and 47% powdery mildew coverage, respectively.

CONTROL OF RHIZOCTONIA IN POINSETTIAS

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Three rates of Cleary's 3336 50WP and two rates of Banrot 40WP were evaluated for their control of Rhizoctonia root rot and stem canker in transplanted cuttings inoculated with the pathogen. 'Freedom Red' cuttings were transplanted into 6" pots containing Cornell peat-lite mix and drench treatments were applied on 8/7/97; a second drench was made on 9/3. Inoculum in the form of an 8mm agar disk from a culture of *Rhizoctonia solani* was added into the corner of each pot on 8/8. There were 5 replications of 3 plants for each drench treatment. On 9/23, root rot and stem canker symptom were recorded for all plants. Stem canker symptoms were reduced most effectively (Fisher's Protected LSD, p=0.05) by Cleary's 3336 or Banrot at 12 oz/100 gal rates. Banrot at 6 oz/100 gal was not effective at reducing canker incidence, whereas Cleary's 3336 at 8 and 16 oz did give significant canker reduction. Root rot ratings (on a scale of 1 to 4, with 1=white healthy roots and 4=complete root rot) showed that all treatments were effective at improving root health except for the 6 oz/100 gal Banrot rate. The 6 oz/100 gal Banrot rate was not effective under the high inoculum pressure used in this experiment.

Nursery & Landscape

SYSTEMIC INSECTICIDES FOR CONTROL OF ARBORVITAE LEAFMINER

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

Five treatments were tested for control of arborvitae leafminer on 5-6' 'Emerald' arborvitae, including Cygon 2E, Orthene TTO 75 and Avid foliar sprays, Marathon drench and an untreated control. Foliar sprays were applied in early May (62 GDD), Marathon root zone drench was applied in early April. Larvae were active in the mines at the time of application. Each treatment was replicated five times to plants arranged in a completely randomized design. Treatments were evaluated in mid-May by selecting branches from each tree and counting live and dead larvae.

No treatment effect was apparent in this trial. Possible reasons include that overwintered foliage may be too resistant to penetration of foliar insecticides and Marathon may perform better when applied in fall. Late summer applications have been effective and the trial was repeated in early September to be evaluated next spring. Based on data reported elsewhere, a 2(ee) recommendation was approved in NY for the use of Orthene against this pest.

This project was supported by Friends of Long Island Horticulture.

CONTROL OF BLACK VINE WEEVIL WITH MEDIA-INCORPORATED INSECTICIDES

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

This trial was conducted to evaluate control of black vine weevil (BVW) larvae using media pre-treated with insecticide. Taxus liners were potted in early May in containers with a standard organic media pre-treated with two rates of fipronil (Rhône-Poulenc). Plants in untreated media received either a single Orthene or water-only drench at the end of the growing season. Pots were repeatedly infested from spring through late summer with BVW eggs and maintained on drip irrigation under shade cloth. Treatments were evaluated by inspecting roots for grubs and feeding damage in fall.

Untreated pots had 2 - 3 larvae/pot and moderate levels of root damage. All media-incorporated treatments provided good control of BVW larvae and plants had no root damage. Plants receiving the Orthene-only drench had slight root damage and very few larvae.

CONTROL OF ORIENTAL BEETLE GRUBS IN CONTAINER-GROWN PLANTS

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory
Investigators: Tamson Yeh
Location: Cornell Cooperative Extension of Nassau County

The objective of this trial was to evaluated nematodes and insecticides for control of oriental beetle grubs in container-grown plants. Eleven treatments were compared, including three rates each of Orthene drench and Pinpoint granular topical application (both acephate-based), two rates of Marathon (imidacloprid) drench, two rates of *Heterorhabditis bacteriophora* nematodes as a drench, and a water-only drench control. Standard 1-gal. nursery pots filled with organic-based media oversown with

grass seed were used in this trial. Pots were infested with grubs (instars 2-3) collected from untreated sod. Treatments were evaluated about 1 month after application.

The two highest rates of Orthene and the highest rate of Pinpoint provided the best control (97%), followed by the middle rate of Pinpoint (81%), the lowest rate of Orthene (83%) and the highest rate of Marathon (74%). The lowest rates of Marathon and Pinpoint were comparable, giving about 50-60% control. Although some infected grubs were found in pots treated with the highest rate of nematodes, when used at either rate nematodes did not appear to be have any statistically significant effect on grub mortality compared with the controls.

This project was supported by Friends of Long Island Horticulture.

PHYTOTOXICITY OF CYHEXATIN TO CONTAINER-GROWN SHRUBS

Investigators: D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

Two rates of cyhexatin (formerly Plictran) miticide were applied to a variety of container-grown shrubs and evaluated for phytotoxicity. All plants had tender new foliage, except for Euonymus, at the time of application. Rose and spirea were also in bud and/or bloom. Treatments were applied to drip to *Rhododendron* x 'Hino Crimson', *Ilex* x *meserveae* 'Blue Maid', *Euonymus alatus* 'Compactus', *Ilex crenata* 'Convexa', *Juniperus horizontalis* 'Plumosa Compacta', *Ligustrum ovalifolium*, *Picea glauca* 'Conica', *Pieris japonica* 'Mountain Fire', *Rosa rugosa* (pink), *Spiraea japonica* 'Anthony Waterer', *Viburnum dentatum* 'Chicago Lustre' and *Weigela florida* 'Red Prince'. Plants were rated periodically up to 20 days after treatment for injury.

Only two cultivars clearly showed treatment-related injury, and then only at the high rate. Azalea showed a very light necrotic spotting or streaking and very slight marginal or tip necrosis to youngest leaves only. Tender foliage on andromeda showed a very slight distortion or scarring, which seemed to become less noticeable over time. Older, hardened-off foliage on both cultivars was unaffected.

1997 SUFFOLK COUNTY ORIENTAL BEETLE PHEROMONE TRAP MONITORING PROGRAM

Investigators: A. Corbin, D. Gilrein and L. Siracusano
Location: Long Island Horticultural Research Laboratory

Oriental beetle grubs are serious pests of turfgrasses and nursery stock. Both container- and field-grown shrubs are affected and direct monitoring is difficult. A recently developed pheromone appears to be quite effective in attracting adult males, but has not been evaluated as a tool for predicting severity of infestation or need for control. This project tested this possibility in a production nursery, comparing pheromone trap counts to infestation of a variety of container-grown plants.

Eighteen traps were baited and set among container-grown *Pieris*, *Ilex* and *Juniperus*, then inspected twice a week for trapped beetles. In fall, 50 pots around each trap were checked for grubs, including 25 insecticide-treated and 25 untreated pots. Regression analysis was used to determine the association of pot infestation with cultivar, nearby trap counts and insecticide treatment. Trap counts did not appear to be strongly associated with pot infestatation and insecticide treatment did not appear to have an overall significant effect. However, *Ilex* had consistently the highest level of infestation among the three cultivars. *Juniperus* and *Pieris* were not significantly different.

UTILIZING YARD-WASTE COMPOST AS A LANDSCAPE BED AMENDMENT

Investigator: Scott Clark
Location: Suffolk County Farm and Education Center, Yaphank, New York

Yard-waste compost processed with a 3/8 inch screen was incorporated at 0, 1, 3, and 6 inches into 6 inches of soil (equal to 0, 14%, 33% and 50%, respectively) on June 22, 1995. There were 3 replications of each plot arranged in a randomized complete block design. No amendments were added to the control plots. Nutrient analyses were done at least annually to determine the nutrient contribution of yard-waste compost to soils over time. A summary is offered:

The pH, P, K, Mg, Ca, Mn, Zn, and organic matter (OM) levels increased significantly with increasing amounts of compost. In general, P, K, Mg, Al, and Fe in the compost treated plots decreased from 7/21/95 to 8/19/97 while Ca, Mn and Zn relatively stable. P, Mg, Ca, Mn, Zn, and OM increased slightly in the control plots over time and may be attributed to the breakdown of the chipped wood mulch applied annually for weed control.

It was interesting to note that K and P decreased up to 60% and 50%, respectively, in compost amended soils. pH decreased only 0.5 pH unit (7.0 to 6.5) in three growing seasons in the 50% compost plot. OM content increased slightly in the 0% and 14% compost treatments and may be attributed to the breakdown of the mulch while the level remained constant in the 33% compost plot and decreased from 6.1% to 5.4% in the 50% compost treated plots.

This project was supported by Friendsof Long Island Horticulture, Long Island Arboricultural Association, Nassau-Suffolk Landscape Gardener's Association, and The Plantage.

MITIGATING ROOTING OUT PROBLEMS IN PLANTS GROWN IN A POT & POT SYSTME

Investigator: S. Clark and R. Martin
Location: Long Island Horticultural Research Laboratory

The objective of the study was to investigate the effect of various treatments on reducing rooting out of plants into the surrounding soil with trees grown in a pot & pot system. Seven treatments were investigated: untreated control, planted container spun one time during the season, spinout painted container, 1 piece of biobarrier placed between the liner pot and planted container; 2 pieces of biobarrier, 1x spinout treated texel bag, and 2x spinout treated texel bag. On May 7, 1997, eighty four Salix matsudana 'Scalet Curls' (5' branched) and Acer platanoides 'Deborah (6' whips) bare-root liners were root-pruned and planted into 10 gallon containers (Nursery Supplies) with a 1:1 loblolly pine bark:yard-waste compost media. All plants were planted directly into the container except for the spinout treated bags where the plants were planted into the bag lining the potted container. Plants were fertilized, staked, and pruned to 6' three days after planting. Plants were irrigated daily with spray stakes. Pots in the turning treatment were turned on August 16, 1997. Only the Salix matsudana 'Scarlet Curls' rooted out sufficiently in the controls during the 1997 growing season. Results will be taken or the Acer platanoides 'Deborah' during 1998.

Mean stem caliper was not significantly different for any of the treatments at the beginning of the study. Mean caliper, length of stems, or plant height was not significantly affected by any of the treatments. By the end of the first growing season, 100% of the control plants were rooted in. Turning the pots one time significantly reduced rooting out compared to the control but 50% of the plants rooted back into the soil over the next 2 months. Spinout treated plants did not significantly reduce

rooting out compared to the controls. Texel bags treated with spinout and biobarrier treatments were very effective in reducing rooting out of Salix.

When the % root cover on the container media interface was measured, it became clear that spinout and the spinout treated bags were very effective at reducing root girdling of Salix matsudana 'Scarlet Curls, while significant root cover (up to 60%) was seen in the control, turned, and biobarrier treatments.

The texel bags look promising since they significantly reduced rooting out and girdling roots of plants grown in a pot & pot system.

DORMANT HERBICIDE APPLICATION FOR WEED CONTROL IN PERENNIALS

Investigators: A. Senesac and I. Tsontakis-Bradley
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory to examine herbicide application to dormant perennials being prepared for overwintering. *Astilbe, hosta, oenethera, sedum,* and *penstemon* were treated in November of 1996, stored in an overwintering house, then evaluated in the Spring of 1997. Treatments included Rout 3G at 3 lbs/a (a.i.), Ronstar 2G at 4 lbs/a, Surflan 4AS at 3 lbs/a, and Dithiopyr (Dimension) 1EC at 0.5 lbs/a a.i., and an untreated control.

The results of visual evaluations and destructive harvests indicate that dormant application of Ronstar appeared to be safe on astilbe, hosta and oenotherea, but not sedum and penstemon. Rout and Surflan caused some injury to all species except penstemon. Dimension injured hosta sedum and penstemon. At least in the case of Ronstar, it appears that a dormant winter application is a relatively safe timing.

WEED CONTROL IN CONTAINERIZED WOODY ORNAMENTALS: STANDARD AND POT-IN-POT (IN GROUND CONTAINER)

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory to examine the effect of herbicides on container-grown woody ornamentals grown in both standard and pot-in-pot (in-ground container) container fields.

Woody ornamentals, which were grown in a standard container field in one gallon containers and/or in a pot-in-pot field in 3 gallon containers, included *Acer griseum* (p-in-p and standard), *Cornus alternifolia* (p-in-p), *Viburnum lantana* (standard), and *Forsythia intermedia* 'Lynwood Gold' (standard).

Cornus, Viburnum, and *Forsythia* were treated with Prodiamine 65WG at 0.75, 1.5 and 3.0 lbs/a a.i. *Acer* (both standard and pot-in-pot) was treated with Pendimethalin 2G at 1.5, 3.0, and 6.0 lbs/a a.i. The control (and the entire test) was maintained weed free.

This test resulted in no significant treatment differences in plant height, caliper or observable injury among the species.

For *Acer griseum,* no differences in herbicide effect were observed between pot-in-pot and standard container-grown plants.

HERBICIDE TOLERANCE OF CONTAINERIZED PERENNIALS

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory to examine tolerance of several perennials to certain herbicides. In May of 1997, *Achillea millifolium* 'Cerise Queen', *Lysimachia punctata*, *Perovskia atriplicifolia*, *Physostegia virginiana* 'Vivid', *Astilbe* spp., and *Oenethera fruticosa* were transplanted to quart containers containing a compost/bark potting mix. Treatments were applied on June 5 including Oxyfluorfen&Oryzalin (Rout 3G) at 3, 6, and 12 lbs/a a.i.; Oryzalin (Surflan 4AS) at 2, 4, and 8 lbs/a a.i.; Pendimethalin (Pendulum 2G) at 1.5, 3, and 6 lbs/a a.i.; and Prodiamine (Factor 65WG) at 0.75, 1.5, and 3 lbs/a a.i. and an untreated control. (Astilbe, lysimachia, and perovskia were not treated with Rout.)

Achillea treated with the high rate of Rout showed injury symptoms. Lysimachia treated with Surflan and Factor at all rates showed injury symptoms at various times during the season and had significantly lower harvest weights. Rout-treated oenethera saw early injury at all rates; harvest weights were lower for these plants. The high rate of Surflan also caused low harvest weights for oenethera. Physostegia harvest weights were lower for plants treated with the two higher rates of Surflan. No significant injury or harvest weight differences were seen in astilbe. No treatment effect trend was detected in perovskia.

CUTFLOWER TRANSPLANT TOLERANCE TO HERBICIDES

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory to determine field transplanted cutflower tolerance to certain herbicides. Seedlings of *Cosmos* 'Qis Rose', *Ageratum* 'Blue Horizon', China Aster 'Matsumoto Blue', *Delphinium x cultorum* 'Pacific Giant Galahad' & *D. elatum* 'Magic Fountain Sky Blue w/White' , *Helichrysum* 'Fireball', Snapdragon 'Rocket Rose', and Statice 'Excel. Dark Blue' were transplanted into Riverhead Sandy Loam on May 23, 1997. Pre-transplant treatments of Oxyfluorfen 1.6EC at 0.25, 0.5, and 1 lb/a a.i. were applied on May 22, 1997. Post transplant treatments of Prodiamine 65WDG at 0.75, 1.5, and 3 lbs/a a.i.; Metolachlor 7.8EC at 2, 4, and 8 lbs/a a.i.; and Thiazopyr 2EC at 0.5, 1, and 2 lbs /a a.i. were applied on May 24, 1997. Post transplant treatments of Clethodim 1EC + X77(@.25%) were applied on June 20, 1997 at 0.25, 0.5, and 1 lb/a a.i.

Plants treated with oxyfluorfen at the high rate had lower harvest weights in aster, delphinium, snapdragon, and strawflower. High rate prodiamine-treated ageratum, snapdragon, statice, and strawflower had lower harvest weights. Ageratum, delphinium, snapdragon, and strawflower treated with metolachlor at the high rate had lower weights. Thiazopyr-treated ageratum, cosmos, snapdragon, and statice had lower harvest weights. Clethodim lowered harvest weights for aster.

WEED CONTROL FOR SEEDED CUTFLOWERS WITH NON-HERBICIDE METHODS

Investigator: A. Senesac and D. Moyer
Location: Long Island Horticultural Research Laboratory

Propane flame weed burners and brush hoes are fairly new technologies developed in the search for non-chemical weed control for a variety of crops. Flamer weed control is attained through the use of intense directed heat produced from a tractor mounted liquid propane powered flaming device. The brush hoe is a series of very stiff bristled brushes which rotate on the soil surface to brush it free of weeds. These two devices

were included in a study conducted at the Long Island Horticultural Research Laboratory to explore non-herbicide methods of weed control for field seeded cutflowers.

All treatments began as a stale seed bed (the field was prepared for planting then left undisturbed to allow the first flush of weeds to germinate) which began after rototilling of beds in Riverhead Sandy Loam on June 9, 1997. *Zinnia* 'Magnificent Mix' was seeded. Treatments and seeding were applied in two timings: the first on June 20, the second on June 25. Treatments included an untreated weedy, an untreated weedy which was handweeded just before planting, a handweeded which was handweeded throughout the season, Round-Up at 1.0 lb/a a.i. sprayed at planting time, and propane flaming which was performed at planting time. All treatments were applied with and without brush hoeing which was performed on July 10 for both timings. Brush hoeing was done between rows only.

Early in the season, all treatments maintained fair to good weed control. Later, as additional flushes of weeds germinated, the plots became very weedy. At harvest on August 8, the Round-Up treatments with and without brush hoeing and the untreated weedy which was weeded at planting and brush hoed had significantly fewer weeds in row than the other treatments. Between row, all the brush hoed treatments had fewer weeds than their non-brush hoed counterparts. For some brush hoe treatments, fewer zinnias were harvested than for their non-brush hoe counterparts.

This project was supported by Fred C. Gloeckner Foundation, Inc. and the Friendsof Long Island Horticulture.

WEED MANAGEMENT FOR CONTAINER-GROWN CHRYSANTHEMUMS AND ORNAMENTAL KALE

Investigators: A. Senesac and R. Freeman
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory in 1997 to examine weed management options for container-grown chrysanthemums and ornamental kale. Three varieties of mum rooted cuttings, 'Lisa', 'Linda', and 'Jennifer' were transplanted to potting mix in #350 mum pans on 5/28/97. They were pinched on 6/4/97. Kale 'Nagoya' was started from seed on 5/15/97 and transplanted to gallon pots of potting mix on 5/27/97. These plants were treated on 6/5/97 with Pendimethalin (Pendulum) at 4 lbs/a a.i. in four forms: 60 WDG, 3.3 EC, 2 G, and 60 WDG on paper mulch pellets; Oryzalin (Surflan) 4 AS and 4 AS on paper mulch pellets both at 4 lbs/a a.i.; Prodiamine (Factor) 65 WDG at 1.5 lbs/a a.i.; Trifluralin (Preen) 1.5 WDG at 4 lbs/a a.i.; and Napropamide (Devrinol) 50 WDG at 4 lbs/a a.i. The control was handweeded. Phytotoxicity data was taken biweekly. Early (4 WAT) and late (12 WAT) harvests were performed with half the plants being taken for each.

Pendimethalin 3.3 EC and 60 WDG caused significant injury in all three mum varieties in the earlier weeks after treatment and lower weights for the early harvest. By the end of the season and the late harvest, all three mum varieties showed recovery from these treatments. The pelletized Pendimethalin 60 WDG appeared to safen it slightly early in the season, but by the end of the season, injury was greater for the pellet treated plants. Similar results were seen with Oryzalin in mum 'Jennifer'. The Oryzalin sprayed plants recovered from injury while the Oryzalin pellet plants showed more injury at the end of the season.

Early injury and lower harvest weights were seen in kale treated with Pendimethalin 3.3 EC, 60 WDG and Oryzalin 4 AS. By season's end, only the Pendimethalin 60 WDG treated plants had recovered. Pelletization of Pendimethalin

and Oryzalin appeared to result in safening on kale which lasted throughout the season.

This project was supported by Fred C. Gloeckner Foundation, Inc.

EVALUATION OF PENDIMETHALIN FORMULATIONS ON ORNAMENTALS

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

Two studies were conducted to examine the phytotoxicity of pendimethalin applied in different formulations and at different growth stages. In one study, container grown yews (*Taxus* X *media* 'Densiformis'), were treated with either of two commercially available formulations, emulsifiable concentrate (EC) water dispersible granule (WDG) or the experimental formulation: capsule suspension (CS). Pendimethalin (4.5 kg ha-1) treatments were sprayed over the top in the Spring at one of three timings: bud break, mid spring flush and post spring flush. Phytotoxicity was evaluated periodically through growing season. The results of the evaluations indicate that the EC formulation caused injury to the terminal buds when applied at all three timings. The WDG caused bud injury only when applied at the latter two timings and the CS was safe at all three timings.

In the other study, ornamental kale, (*Brassica oleracea*) ornamental cabbage (*Brassica oleracea*) and pansy (*Viola tricolor*) were treated with the same pendimethalin rate and formulations at one timing, post transplant. Visual evaluations were made and fresh and dry weights were measured. The results indicate that the EC and WDG were equally severely injurious to all three species. However, while the CS formulation was safe on cabbage and kale, it did cause significant injury to pansy.

FIELD SEEDED CUTFLOWERS: PREEMERGENCE HERBICIDES

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

Preemergence weed control was examined in a study conducted at the Long Island Horticultural Research Laboratory. *Celosia argentea* 'Pink Tassels', Sunflower 'Full Sun', and *Zinnia* 'Yoga Mix' were seeded into Riverhead Sandy Loam on 6/11/97. Treatments applied 6/12/97 included Carfentrazone 50DF at 0.0625 and 0.125 lbs/a a.i.; Pennant 7.8EC at 0.5 and 1.0 lbs/a a.i.; Goal 2XL at 0.0625 and 0.125 lbs/a a.i.; Tupersan 50WP at 2.0 and 4.0 lbs/a a.i.; and Visor 2EC at 0.125 and 0.25 lbs/a a.i.. The test also included a handweeded and weedy control.

Weed control data collected four weeks after treatment revealed excellent control of native populations of lambsquarters and pigweed by Goal at the high rate. Tupersan was not effective on these weeds but did control pigweed and annual grasses well. Pennant and Visor were also effective on grasses.

A lower harvest fresh weight was found for Sunflower treated with Tupersan five weeks after treatment. Lower harvest weights were observed for Zinnia treated with Tupersan, Carfentrazone high rate, and Goal at the high rate. For Celosia, harvest weights were lower for plants treated with Carfentrazone, Goal, and the high rates of Tupersan and Visor.

PAPER PELLET MULCH FOR WEED CONTROL IN CONTAINER NURSERIES

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

Premergence herbicides sprayed over the top of container grown herbaceous ornamentals can often cause injury. Although several of these are available in granular form, they too have the potential to injure if small granules are caught in leaf axils. The commercial growers of containerized annuals and perennials continually search for a weed control regime which is efficacious, easy to use and safe on a wide variety of species. The use of paper mulch pellets permeated with herbicides may be a viable solution. In previous research, we have examined the combination of commonly used herbicides to allow for reduced rates of application while offering broader and more effective control. These combinations are not commercially available, so an additional use for the paper pellet mulch may be as host for them.

Several replicated field trials were conducted at the Long Island Horticultural Research Laboratory to examine efficacy and phytotoxicity and to investigate methodologies for the use of paper pellet mulch. The two paper pellet mulches used in these tests were designed to aid in erosion control and turfgrass establishment. One was manufactured using recycled paper, the other using paper and wood fiber. In all of these tests, the paper pellet mulch was permeated with spray herbicides, manually mixed, then applied to the soil surface at a herbicide rate equivalent to the surface broadcast rate. These were compared to the paper pellets alone, broadcast liquid herbicides, and granular herbicides. Weed control and tolerance of perennials and annuals were evaluated throughout the season.

Generally, weed control for the pellet/herbicide treatments was equivalent to and occasionally better than that of conventionally applied herbicides. Even, thorough distribution of the pellets is necessary to achieve control equal to sprayables. One method of broadcasting liquid herbicide over-the-top then covering the soil surface with the pellets significantly increased control but also increased injury to the crop. Weed growth was greater through the pellets alone than in the untreated control.

Ornamental species tested included four cultivars of chrysanthemum, pansy, liatris, ornamental cabbage and ornamental kale. For most of these species, several pellet/herbicide treatments appeared to partially safen herbicides which sprayed over-the-top caused injury. But the broadcast treated plants recovered later in the season whereas the pellet/herbicide treated plants did not.

This method of applying herbicides for container grown crops is worthy of future study. Tests with additional methodologies, weed and crop species, and new herbicide combinations should be examined.

BEDDING PLANT TOLERANCE TO HERBICIDES

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory in 1997 to determine the tolerance of field grown bedding plants to prodiamine, clethodim, and sethoxydim. Five species of bedding plants were transplanted into Riverhead Sandy Loam on May 23, 1997. Red varieties were specifically chosen to observe effect to color of the plants including: Begonia 'Varsity Scarlet', Impatiens 'Impulse Red', Marigold 'Bonanza Flare Imp.', Petunia 'Prime Time Red', and Salvia 'Maestro'. These were treated with Prodiamine (Factor 65 WG) pre transplant at 0.75, 1.5, and 3.0 lbs/a a.i., one day after transplant at 1.5 lbs/a a.i., and pre + 11 weeks post transplant at 0.75 and 1.5 lbs/a a.i.; with Clethodim (Envoy H&G 0.25 EC) twelve

weeks post transplant at 0.17 and 0.47 lbs/ac. a.i.; and with Sethoxydim + COC @ 1% (Vantage 1.0 EC) at 0.48 lbs/a a.i. and V-10060 1.0 EC at 0.17 lbs/a a.i. 12 weeks post transplant.

All pre and early post treatments showed at least minimal but significant injury, especially stunting. The second application of Factor 11 weeks post transplant appeared to have little, if any significant effect compared to the plots treated with the same rates of Barricade pre transplant only. Immediately following the Clethodim treatments, flower color fading was evident, especially in petunia, salvia, and begonia. The petunias recovered within two weeks; the begonias did not; the salvia recovered slightly. The stunting effect of the higher rate pre transplant and both rates of the pre + post Factor treatments was evident in the results of a late season harvest. Fresh weights of begonia and petunia were significantly lower for these treatments.

WEED CONTROL WITH THIAZOPYR COMBINATIONS

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

Control of some common container weeds was tested at the Long Island Horticultural Research Laboratory. Weed seeds of annual bluegrass, hairy bittercress, galinsoga, groundsel, pineapple weed, and prostrate spurge were planted into a compost: bark potting mix in 20"X14" flats and grown under 50% shade. Treatments included an untreated control plus thiazopyr 2EC at 0.5 and 1.0 lbs/a a.i.; thiazopyr 0.5%G and 1.0%G at 0.5 and 1.0 lbs/a a.i. respectively; oryzalin 4AS at 3.0 lbs/a a.i.; Rout (oxyfluorfen + oryzalin) at 3.0 lbs/a a.i.; and combinations of thiazopyr and oxyfluorfen granular at four different rates of each chemical.

Six weeks after treatment all herbicides were at least somewhat effective at controlling all the weeds tested with the exception of oryzalin on hairy bittercress. Eight weeks after treatment efficacy faded for some treatments, notably, thiazopyr granular on bluegrass. Thiazopyr spray was effective on all weeds tested: the only significant decrease in control was for galinsoga and groundsel at eight weeks. Likewise, Rout and oryzalin were as effective as thiazopyr spray on all weeds at six weeks with the exceptions of groundsel and hairy bittercress for oryzalin and prostrate spurge for Rout. Thiazopyr spray was more effective than the granular thiazopyr though not always statistically so. The thiazopyr/oxyfluorfen combinations at the low rates were less effective than other treatments, but at the high rates they were as effective.

HERBICIDE TOLERANCE OF FALL PLANTED BULBS

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

A study was conducted at the Long Island Horticultural Research Laboratory to examine preemergence weed control options for fall-planted bulbs. Bulbs of *Allium moly*, *Crocus sp.*, *Eranthis cilicia*, *Muscari armeniacum*, *Pushkinia libanotica*, and *Scilla siberica* were planted into Riverhead Sandy Loam on October 8, 1996. They were treated on October 17, 1996 with Prodiamine 65WDG at 0.75, 1.5, and 3.0 lbs/a a.i.; Sulfentrazone 80WP at 0.25 lbs/a a.i.; Oryzalin 4AS at 4.0 lbs/a a.i.; Pendimethalin 60WG at 3.0 lbs/a a.i.; Prodiamine + Sulftenrazone at 0.75+0.25 lbs/a a.i.; and Prodiamine + Metolachlor + Norflurazon at 0.25+1.0+0.8 lbs/a a.i.; weedy and handweeded controls.

On March 12, 1997, the number of native chickweed and pineapple weed plants was significantly lower than untreated for all treatments except prodiamine at 1.0 lb/a a.i. on pineapple weed. The treatments appeared to have little effect on plant

emergence. Allium treated with sulfentrazone alone and in combination with prodiamine had significantly lower harvest weights than the untreated plants. Crocus treated with the high rates of prodiamine alone and in combination with sulfentrazone had lower bulb weights. Eranthis treated with pendimethalin and the prodiamine/sulfentrazone combination also had significantly lower weights than the handweeded control.

PROBLEM DIAGNOSIS FOR NURSERY CROPS, 1997

Investigators: M. Daughtrey, D. Gilrein, M. Macksel and N. Shishkoff
Location: Long Island Horticultural Research Laboratory

There were 144 woody and herbaceous perennial plant samples submitted for diagnosis in 1997. *Phytophthora* species were responsible for a number of cases of root rot this year on azalea, daphne, halesia, and lamium. Diplodia (Sphaeropsis) tip blight and Contarinia gall midge were common on Doug fir. Cyclamen mites were seen on mum, rosemary, ajuga, vinca and delphinium. Juniper webworm and Kabatina tip blight were seen on junipers. Rhizoctonia, Fusarium, Cylindrocladium and Pythium root rots were common on woody and herbaceous perennials in container production and in the landscape. Anthracnose diseases caused by different*Colletotrichum* species were problematic on 'Emerald and Gold' euonymus and on lupines; another anthracnose caused by *Monostichella robergei*, was seen on *Carpinus*. Oystershell scale, along with Nectria and Phomopsis cankers, caused dieback on euonymus in one nursery. Botryosphaeria canker was the common cause of dieback in rhododendrons. Quince rust was dramatic on some *Juniperus virginiana*. Foliar nematode (*Aphelenchoides* sp.) caused leaf lesions on *Helleborus* and leaf spots and stunted growth on 'Hershey Red' azalea during nursery production. In the leaf spot category, Ramularia was seen on phlox and pansy, white smut (*Entyloma*) on gaillardia, and Alternaria on California privet. Downy mildew was observed on creeping phlox and geum. Dutch elm disease was identified in a landscape elm in Riverhead. Chrysanthemum white rust, caused by *Puccinia horiana*, a disease regulated by state and federal quarantines, was detected in September in a Queens backyard planting of mums grown for show. The infestation was eradicated; all chrysanthemum material was removed and incinerated by NYS Ag & Markets.

POWDERY MILDEW EVALUATION ON FLOWERING DOGWOOD, 1997

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Powdery mildew was observed in our dogwood cultivar comparison plots for the first time on 29 July 1994. The fungus often forms only thin, barely visible, growth on the dogwood leaf surface, and may cause reddening or terminal leaf distortion that is more obvious than the white coating of mycelium. Cleistothecia of a *Microsphaera* sp. were not seen in 1994, but were observed in 1995, 1996 and 1997. Ratings made 8 October 1997 showed that *Cornus kousa* had no visible powdery mildew, whereas, at the opposite end of the spectrum, *Cornus florida* 'Cherokee Sunset' was heavily infected and showed dieback which may have been due to the impact of several consecutive years of powdery mildew infection. The other cultivars were intermediate in their susceptibility. 'Barton' and 'Cloud 9' showed less powdery mildew than 'Rubra', 'Cherokee Red' or the seedlings of *C. florida* . Ratings made on a 0-4 scale (0=no visible mildew to 4=leaves thickly coated, plus dieback and stunting) were analyzed using Fisher's Protected LSD, p=0.05. The impact of this disease on trees already stressed by drought is a matter of concern.

SPOT ANTHRACNOSE AND DOGWOOD ANTHRACNOSE, 1996-7

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

A plot containing 216 *Cornus florida* seedlings established in 1991 as part of a multi-state study sponsored by the USDA-US Forest Service was used to evaluate the effects of three irrigation treatments (1" of water supplied per week, 1" supplied on alternate weeks, and no irrigation except under severe drought conditions) and two fertilization treatments (+/- ammonium nitrate, spring application of 3 lb N/1000 sq ft) on two dogwood diseases. All trees showed some infection from both fungi annually, but the severity of the diseases was very light in both years. There were no protracted periods of leaf wetness and gray, cloudy skies in either spring that would have encouraged dogwood anthracnose epidemic development in sun-exposed trees. No significant effects of irrigation or fertilizer treatments on the number of leaves per tree with anthracnose were seen, in either year. In 1997 only, the ratings for spot anthracnose were higher on trees in the most-frequently irrigated treatments than in the ones irrigated only after the trees showed signs of drought stress. Data were analyzed as a split-plot using an analysis of variance (SuperAnova).

EVALUATION OF LYNX FOR CONTROL OF BLACK SPOT OF ROSE

Investigators: M. Daughtrey and M. Macksel
Location: Long Island Horticultural Research Laboratory

Lynx is a fungicide with tebuconazole as its active ingredient. We tested its ability to control black spot disease on the hybrid tea rose 'Kentucky Derby' in summer, 1997. Because of Lynx's systemic properties, we tested the ability of the material to control the disease not only with sprays of the 25 DF formulation at 6 g/100 gal at 14-day intervals but also with drenches of the 25DF to the container surface (applying 4.8 g in 1 quart volume to each plant) every 21 days, or applications of a 1% granular formulation at 90 g/plant every 21 days, also made to the mix surface. A Banner MAXX 14.3EC spray at 8 oz/100 gal at a 14-day interval was used as an industry standard. There were 4 replications of 4 plants for each treatment, which were planted in 5 gal containers in a nursery bark mix on 4/30. Sprays were made with a hand-held CO_2 sprayer using a hollow cone nozzle, at 28 p.s.i. Plants were fertilized with 3-12-6 Rose Special at 1 tablespoon per pot on 5/15 and 7/29; overhead irrigation was supplied twice daily. Treatments began 6/12 and continued until 9/7. Black spot symptoms were not seen until 7/25, and the disease developed slowly. Ratings were made 8/19, 9/2 and 9/22 of the number of leaflets with black spot for each plant. At the final rating, 9/22, untreated plants had a mean of 52 leaflets with symptoms, and Lynx granular topdress (37.4 leaflets) and Lynx spray (65.9 leaflets) were no longer giving significant control (Fisher's Protected LSD, p=0.05). Banner MAXX was effective (22.5 leaflets) and Lynx drench (2.3 leaflets) was better than the Banner treatment. Roses drenched with Lynx retained all their leaves, whereas plants in other treatments lost their lower leaves during the trial.

Turf

CRABGRASS CONTROL WITH CORN GLUTEN

Investigators: A. Senesac and D. Corbin
Location: Long Island Horticultureal Research Laboratory, Crabgrass plots Block 9

This study was initiated to determine if corn gluten can provide acceptable crabgrass control in turf. Additionally we were also interested in learning the source of the effect on crabgrass: i.e. fertilizer effect or herbicidal effect. Treatments were applied in mid April, 1997 to a sparse ryegrass sod heavily infested with hairy and smooth crabgrass seed. Three brands of corn gluten were compared. Two are fine dustlike granules and the other is a heavier pellet. Other treatments consisted of organic and inorganic fertilizers applied at 1lb N/1000 sq. ft. four times during the year. This is the same amount of nitrogen that the full rate of corn gluten delivers when applied twice during the year.

The plots were visually evaluated 3 times during the season and crabgrass plant numbers were sampled at the end of the season. The results indicate that, while crabgrass was controlled initially slightly better with the finer particle corn gluten than the pelletized product, overall, no corn gluten product provided greater than 35% crabgrass control. Minimal commercial expectations of a preemergence herbicide are generally at 70% or greater. The crabgrass number data indicates that corn gluten provided some inhibitory effect on crabgrass germination and growth, but not significantly different from the effect that ammonium sulfate (fertilizer effect) had by causing greater turf growth and thicker crop canopy.

These treatments will be reapplied each Fall and Spring for the next two years to determine if there is a significant long term effect on crabgrass growth.

PREEMERGENT CRABGRASS CONTROL

Investigator: A. Senesac
Location: Long Island Horticultural Research Laboratory

This study was established to examine the relative efficacy of single versus split timings in crabgrass (hairy and smooth) control of the herbicide combination: benefin+trifluralin. Heavily infested perennial ryegrass was treated on April 22,1997 and on some plots, June 26, 1997.Crabgrass control was evaluated three times during the season and in early September, crabgrass numbers were sampled. The results indicate that all treatments were very effective in controlling this weed throughout the season. No treatments were significantly different from each other and all provided at least 90% control through early September.

Vegetables

CONTROL OF EUROPEAN CORN BORER IN PEPPERS

Investigators: D. Gilrein, L. Siracusano and D. Moyer
Location: Long Island Horticultural Research Laboratory

Six treatments were compared for European corn borer control in peppers: Proclaim (emamectin benzoate), Baythroid, Orthene, or Spintor (spinosad) applied weekly, Dipel DF applied twice a week, and an unsprayed control. Plots were replicated four times and peppers were harvested weekly at the green-ripe stage and inspected for ECB damage or infestation.

ECB pressure was moderate from late July through August. The highest levels of undamaged fruit were found in the Orthene and Spintor treatments (95.0 and 95.3%, respectively), followed by Dipel (91%), Proclaim (88.0%), Baythroid (88.0%) and the unsprayed control (77.3%).

CONTROL OF WORMS IN SWEET CORN

Investigators: D. Gilrein, L. Siracusano and D. Moyer
Location: Long Island Horticultural Research Laboratory

Seven treatments were compared for late-season worm control in sweet corn: TD-23544-02 (an experimental pyrethroid), Warrior, ICI-0321-01 (new formulation of Warrior), Baythroid, FCR4545 (experimental pyrethroid), Larvin and an unsprayed control. Treatments were applied approximately every 3-5 days using 100 GPA with a boom or drop-nozzle sprayer. Plots were replicated four times and harvested in early September.

Corn earworm and fall armyworm pressure was low this year and ECB pressure was moderate. There was no sap beetle damage in any treatment. Warrior, ICI-0321, Baythroid and Larvin all gave similar levels of control (85.3 - 92.8% clean ears), followed by TD2344 (83.3%), FCR4545 (79.3%) and the unsprayed control (49.0%).

Warrior and Larvin were tested in 1996 and performed very well when worm pressure was much higher. Warrior was superior to all other labeled materials (Lannate, Asana, diazinon) for control of sap beetles in a trial last year.

EVALUATION OF INSECTICIDES FOR CONTROL OF WORMS IN CABBAGE

Investigators: D. Gilrein, L. Siracusano and D. Moyer
Location: Long Island Horticultural Research Laboratory

Weekly applications of 7 insecticides were compared with unsprayed plots for control of imported cabbageworm, cabbage looper and diamondback moth. Treatments included two formulations of Warrior, an experimental pyrethroid from Elf Atochem (TD2344-02), Spintor (spinosad), Alert (pyrrol), Proclaim (emamectin benzoate), and a standard for comparison (Monitor followed by Dipel). Pest pressure from all three species tended to be rather low. Sprays were applied at 50 GPA with a three-nozzle sprayer.

All materials performed well, as expected, against ICW. The two formulations of Warrior and Alert provided the best control of small loopers, although most other materials provided reasonable control. Lowest numbers of large loopers were observed in plots treated with the two Warrior formulations, Alert, Spintor, and Proclaim. TD-2344-02 allowed some loopers to escape and the damage was reflected in the harvest evaluation, where at least 30% of heads required extensive trimming to be acceptable

for marketing. All other insecticide treatments gave acceptable results in marketability.

EVALUATION OF INSECTICIDES FOR CONTROL OF DIAMONDBACK MOTH IN CABBAGE

Investigators: D. Gilrein, L. Siracusano and D. Moyer
Location: Long Island Horticultural Research Laboratory

Six treatments were compared for control of diamondback moth (DBM), including Spintor (Spinosad), Alert (pyrrol), Xentari (B. t. aizawai), Xentari + Dibrom (naled) and Proclaim (emamectin benzoate). Treatments were applied with adjuvant three times at four-day intervals to two 20'-sections of row, replicated four times, in 50 GPA. Plots were arranged in a randomized complete block design. Evaluation was based on larval counts from ten plants per replicate.

Spintor provided good control after only one application. Populations of DBM were nearly as low in the Alert and Proclaim treatments after two applications. Xentari, with and without Dibrom, provided adequate control after the third spray. Addition of Dibrom to Xentari showed a slight but not statistically significant increase in control of DBM larvae.

SWEET CORN

Investigators: J. Sieczka, D. Gergela, M. Masierowska, I. Rybus, and D. Moyer
Location: Long Island Horticultural Research Laboratory

Bicolor and white varieties of three types (se, sh_2 and sweet breed) of sweet corn were evaluated in six experiments in 1997. Data included plant stand and ear number, weight, and husked and unhusked characteristics.

se: Ten bicolor se sweet corn lines were planted on 6/9/97. The best yielding, relatively attractive lines were XPH3086 and Precious Gem. Other acceptable lines were Polo, Temptation, Delectable and HMX5347. Seven white se sweet corn lines were planted on 5/12/97. Argent, Silver King and Silver Prince produced high yields of relatively attractive ears. Ears of Fantasia had the best husked ear appearance.

sh_2: Eight bicolor and six white sh_2 sweet corn lines were planted on 5/28/97 in separate experiments. The best yielding, relatively attractive bicolor lines were Candy Corner and Bi-Time. Princeton yielded well and had a good appearance. FMX413, XPH3103 and Ice Queen were the most attractive unhusked white lines and had good tip cover and tip fill. XPH3103 had the best appearance rating after husking.

sb: Three bicolor and two white sb sweet corn lines were planted on 6/25/97 in separate experiments. All sb entries produced ears with excellent tip cover. Sweet Symphony was the only entry with relatively good husked appearance and tip fill.

EVALUATION OF GERMINATION TESTS ON SH_2 SWEET CORN

Investigators: I.D. Rybus and J.B. Sieczka
Location: Long Island Horticultural Research Laboratory
and Thompson Vegetable Farm

The objectives of this study are to determine rate of germination of sh2 sweet corn lines with different seedling vigor characteristics in laboratory and field tests under stress and optimum environments, and to correlate laboratory tests with field emergence. Treated and untreated seeds of high, medium, and low vigor varieties were used in this study.

Three laboratory tests were performed: 1) the standard germination test [8 days @77°F (25°C)] and 2) cold test [7 days @ 50°F (10°C), then 8 days @ 77°F (25°C)] were done with both treated and untreated seeds on germination paper and 3) bulk conductivity test was done only with untreated seeds which were soaked for 24 hours @77°F (25°C) then leakage of the solutes was measured with conductivity meter. Seeds of each variety were sown in early spring (4/22/97 - Freeville, 4/30/97 - Long Island) and late spring (5/28/97 - Freeville, 6/6/97 - Long Island). Seedling emergence was initially recorded daily, then later every other day.

The standard test results showed the benefit of seed treatment, especially on low vigor varieties. The cold test, however, was considerably more effective in predicting the performance of low vigor lots, especially in cool soils in the early spring. The conductivity test also showed good correlation with germination in cool conditions. As expected, all varieties planted in the late spring had better overall germination than early spring plantings and the standard test was a reasonable predictor of germination under the warmer conditions.

PEPPERS

Investigators: J. Sieczka, D. Gergela, M. Masierowska, I. Rybus, and D. Moyer
Location: Long Island Horticultural Research Laboratory

Two separate pepper experiments were established in 1997. In one experiment nine pepper lines were evaluated at full maturity for the colored pepper market. In the other experiment, horticultural characteristis of seven bacterial leaf spot resistant lines and one susceptible standard variety were evaluated. Seed for both experiments were planted in the greenhouse on 4/14/97. The experiments were transplanted on 6/5 & 6/97. Both experiments were planted on raised beds covered with black plastic mulch and irrigated by trickle irrigation.

Colored Peppers: Flamingo produced the highest yield of red peppers. Fruit of Islander was the smallest in the experiment. Other entries that produced acceptable yields of red peppers were Enterprise, XPH12205 and XPH12222. Honeybelle produced an acceptable yield of yellow peppers. Valencia peppers were an attractive tangerine-orange color. X3R Aladdin and Commandant yields of colored peppers were unacceptably low.

Bacterial Spot Resistant Peppers: All entries tested except Camelot are resistant to Bacterial Spot and all produced fruit with thick walls. Enterprise produced significantly more marketable yield than the other varieties. X3R Camelot and X3R Wizard had the best appearance ratings.

WATERMELON

Investigators: J. Sieczka, D. Gergela, M. Masierowska, I. Rybus, and D. Moyer
Location: Long Island Horticultural Research Laboratory

Eight watermelon varieties were planted in the greenhouse on 5/14/97 and transplanted into the field on 6/10/97 onto black plastic mulch with trickle irrigation. All entries except Red Honey and Yellow Doll produced large fruit. Royal Majesty, Royal Flush and Mardi Gras produced high yields of attractive elongated fruit. Carnival and Huck Finn produced good yields of broad (as compared to slender) relatively attractive fruit. Red Honey produced a high yield of medium-sized round to oblong fruit. All entries had acceptable to very good flavor.

BRUSSELS SPROUTS

Investigators: J. Sieczka, D. Gergela, M. Masierowska, I. Rybus, and D. Moyer
Location: Long Island Horticultural Research Laboratory

Six lines of Brussels sprouts were planted in a seedbed on 6/2/97 and transplanted in the field on 6/16/97. Data was taken on yield of sprouts, appearance of intact stalks and detached sprouts, and ease of snapping. Capitola did not germinate in the field and Long Island Improved was extremely variable and, therefore, not harvested. There were no significant differences in marketable yield between harvested entries. Diablo, Oliver and Prince Marvel produced similar yield of firm snapped sprouts. Diablo tends to mature later than the standard varieties tested. Oliver heads were the largest. Heads of Diablo and Prince Marvel were firm and smooth. Jade Cross E Sprouts tended to be moderately soft and had many loose wrapper leaves.

PRE SIDEDRESS NITROGEN TEST (PSNT) AS A MEANS OF TAILORING NITROGEN NEEDS IN VEGETABLE PRODUCTION AND REDUCING THE POTENTIAL OF NITRATE CONTAMINATION OF GROUNDWATER

Investigators: J. Sieczka, D. Moyer and D. Gergela
Cooperator: J. Heckman, Rutgers University
Location: Long Island Horticultural Research Laboratory

A pre sidedress nitrogen test experiment was established in 1997, with treatments that correspond to those used in similar studies in New Jersey, Connecticut and Delaware. An early variety of sweet corn, Snow Prince, was planted on 5/7/97 and fertilized at a rate of 43-85-85 lbs/A in bands at planting plus 60 lbs N/A sidedressed. Corn was harvested and the stalks were cut and incorporated into the soil. Cabbage was transplanted on 8/27/97. Soil samples were collected on 8/26/97 and just before sidedressing on 9/15/97. Cabbage was sidedressed at 0, 40, 80, 120 and 160 lbs N/A. Soil samples are being analyzed for nitrate content at the LIHRL and the soil testing laboratory at Cornell. Leaf samples were collected from 20 plants/plot and are also being analyzed for nitrate content. Harvest data were collected on 11/25/97. The results show that optimal number, yield and average weight/head of marketable heads was obtained with 80 lbs N/A. There was no advantage to applying more nitrogen. The 0 lbs N/A sidedress treatment produced the lowest total and marketable yield indicating the residual nitrogen was not adequate to carry the crop.

Some soil samples were also collected from commercial fields where double cropping has been practiced.

This project was supported by Friends of Long Island Horticulture.

EVALUATION AND DEMONSTRATION OF NEW INNOVATIVE CULTIVATION EQUIPMENT IN VEGETABLE PRODUCTION ON LONG ISLAND

Investigators: J. B. Sieczka, A. F. Senesac, D. D. Moyer and R. R. Bellinder
Location: Long Island Horticultural Research Laboratory

Two innovative types of cultivation equipment were purchased to determine their effectiveness in small seeded crops such as herbs and cut flowers. The Rabe Werk S Tine cultivator has adjustable tines that can be raised over crop rows, or set at different levels of aggressiveness. It is intended to be used when weeds are in the "white thread" stage of growth. The Brush Hoe is a set of rotary brushes that can be set for different between row spacing. Tunnels protect the crop plants from the movement of the brushes and/or the soil that is moved by the brushes. Two herb experiments were planted and for different reasons had to be abandoned. Some

preliminary observations, however, weeffective in situations where weeds emerged more quickly than the crops and the weeds were relatively established at the time the herbs could be "rowed" and the equipment used. The Brush Hoe was very effective in eliminating even well established weeds between rows and was somewhat effective in covering small weeds within rows. However, weeding within rows was necessary in dill, basil and marigolds.

The experience in the operation of the equipment in 1997 will allow us to conduct a series of experiments in 1998 to determine the best way to use this equipment in vegetable/herb and cut flower production.

This project was supported by Friendsof Long Island Horticulture.

EFFECTS OF MULCH COLORS ON YIELD OF STAKED AND GROUND PRODUCTION TOMATOES

Investigator: D. Moyer
Cooperators: J. Sieczka and D. Gergela
Location: Long Island Horticultural Research Laboratory

The purpose of this experiment was to determine the effects of red and black mulch with staked and ground production systems on yield and quality of Mt. Spring tomato. SMR-Red and standard black, both 1.0 mil embossed, four feet wide, plastics were applied May 29. On June 4, the variety Mt. Spring was transplanted at 24 inch spacing. Plants in two of the treatments were grown on a short-stake production system with 48 inch stakes and a four string trellis and pruned to three suckers below the first flower cluster. The other two treatments were produced directly on the plastic mulches, referred to as a ground production system. Experimental design was a randomized complete block with four replications. Plots were 1 row by 24' with 68" between rows.

There were no differences in marketable yields between the red and black plastic mulches. However, red mulch treatments resulted in more culls over the full season. The staked production system produced more large size tomatoes in the early season harvest and more large, extra-large and total marketable yields throughout the entire harvest period. Staked treatments produced significantly less small sized tomatoes during the full season. There was no interaction between the mulch colors and production systems.

DEVELOPMENT AND DEMONSTRATION OF TOMCAST FOR FRESH MARKET TOMATOES ON LONG ISLAND

Investigator: D. Moyer
Location: Commercial Farms

The purpose of this study was to evaluate the disease forecasting program, TOMCAST. Side by side demonstrations were established at two farms comparing grower fungicide practices to the TOMCAST disease forecasting program. Short-stake trellis system was compared to ground culture at one site. Weather monitors, Sensor and Adcon, were set up near each field and weather data was collected twice a week to operate the disease forecasting program. The first fungicide application was to be applied when 25 DSVs are reached or mid-July as the fall back date to initiate treatments to ensure that tomatoes do not go too long without a first spray. TOMCAST DSV action threshold was set at 15 for all following fungicide applications. However, during the critical period of fruit ripening a fungicide interval longer than 14 days was not recommended especially if rain was in the forecast and with the concern about powdery mildew and late blight.

Unfortunately, bacterial canker was found in fields at one demonstration site on June 30. Since spray intervals recommended by TOMCAST are not sufficient to manage bacterial canker, forecasting was discontinued at this site. At the other location, weather data collection for disease forecasting began June 13, three days after transplanting. The grower applied his first fungicide application July 15 based on the fail safe date of mid-July after only 15 DSV had accumulated. The second fungicide application was made after 15 DVSs had accumulated. The remainder of the sprays were applied on approximately a 14 day schedule based on the maximum spray interval allowed during the critical ripening period. Due to the dry weather during this time only 9 to 14 DSVs accumulated between sprays. Very low levels of Septoria leaf spot were found during field scouting in the ground culture (grower practice) plot in mid-September.

A total of 6 sprays were applied to both the TOMCAST and grower practice plots. The grower followed the TOMCAST action thresholds in the grower practice plot. However, sprays were reduced by one-half compared to previous years when he applied weekly applications. The short-stake culture produced 50% higher yields than the ground culture. However, both plots had no fruit blemishes from insects or diseases at the time of harvest. The grower felt there was no reduction in yield following fungicide recommendation guidelines from TOMCAST.

SUMMARY OF VEGETABLE IPM PROGRAMS

Investigators: D. Moyer
Location: Commercial Farms

The vegetable IPM programs consisted of five crucifer growers with 30 fields totaling over 275 acres, six sweet corn growers with over 400 acres comprising 56 fields and nine potato growers having 10 fields totaling 200 acres. Growers used the information generated in the IPM programs to improve the timing of pesticide applications and reduced the number of pesticide sprays thus minimizing the environmental impact. The data collected from the IPM programs was published in the weekly newsletter and non-participating growers utilized the information to improve their pest management program.

Pilot IPM programs for peppers, tomatoes, pumpkins and snap beans continued this year. These programs introduced nine growers, with 37 fields totaling 180 acres, to IPM concepts in these crops. In addition, baseline data was collected to assist in the development of a complete IPM program for these crops. Some of the data collected was published in the weekly newsletter.

POWDERY MILDEW OF PUMPKIN: EVALUATION OF CURRENTLY REGISTERED FUNGICIDES AND NEW FUNGICIDES

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

Powdery mildew is a common disease of cucurbits. It is managed primarily by applying fungicides. Pumpkin seed were planted on 24 Jun. All treatments were started after detecting powdery mildew in each plot at one leaf with symptoms out of 50 old leaves examined, which was shown previously to be as effective as using a preventive schedule. Treatments were applied on 15, 23, 30 Aug; 5, 12 and 19 Sep with a tractor-mounted boom sprayer that delivered 100 gpa at 250 psi.

Ways growers can reduce the amount of fungicide used and/or the cost of their fungicide program without a reduction in disease control were identified. The 'standard' fungicide program tested was Bravo Ultrex applied on a 7-day schedule plus three applications of systemic fungicides (Nova, Benlate, Nova) applied on a 14-day

schedule. Nova was used instead of Bayleton because of reduced efficacy due to fungicide resistance in previous trials and because Bayleton is being withdrawn. Equivalent control, at a lower cost, was obtained by substituting copper fungicides (Kocide or Champ) for Bravo and by applying Bravo on a 14-day schedule. All fungicide programs were started after disease detection. Copper (Kocide) and sulfur (Microthiol) applied alone on a 7-day schedule were quite effective on upper leaf surfaces and moderately effective on lower (under) leaf surfaces.

Efficacy data were obtained to support a Section 18 registration request for two systemic fungicides, Nova and Quadris. Quadris (a strobilurin fungicide) applied alone on a 14-day schedule was as effective as the 'standard' fungicide program on a 14-day schedule. EPA considers Quadris a reduced-risk fungicide.

Several biocompatible fungicides were also tested. Kaligreen (potassium bicarbonate), MKP (monopotassium phosphate foliar fertilizer to increase plant defenses), and T-22 (antagonistic fungus *Trichoderma*) partially suppressed powdery mildew but were not as effective at controlling powdery mildew and thus reducing defoliation as conventional fungicides. MKP may be more effective if applied on a preventive basis.

This project was supported by the Friends of Long Island Horticulture.

POWDERY MILDEW OF CUCURBITS: OCCURRENCE OF RESISTANCE TO BAYLETON AND BENLATE AT THE LIHRL IN 1997

Investigators: M. McGrath and N. Shishkoff
Location: Long Island Horticultural Research Laboratory

Occurrence of fungicide resistance before treatment was assessed with a seedling assay. Greenhouse-grown squash seedlings were dipped in 50 ppm triadimefon (active ingredient in Bayleton), 200 ppm benomyl (a.i. in Benlate), or a solution with both fungicides on 7 Aug, then put with nontreated seedlings next to field-grown pumpkin where powdery mildew had just started to develop. Seedlings were returned to the greenhouse 2 days later. Powdery mildew spots were counted after 1 week. Occurrence of fungicide resistance after treatment was assessed by collecting on 11 Sep 16 isolates from nontreated plots and 16 isolates from plots treated with Nova + Benlate + Bravo. Fungicide sensitivity of each isolate was assessed using fungicide-treated leaf disks.

Fungicide resistance to the two currently registered systemic fungicides continues to be a problem. Before treatment, 50% of the pathogen population was resistant to both Bayleton and Benlate. Most isolates (94%) collected on 11 Sep from both treated and nontreated plots were resistant to both Bayleton and Benlate.

This project was supported by the Friends of Long Island Horticulture.

IN VITRO TESTS TO DETERMINE BASE-LINE SENSITIVITY OF CUCURBIT POWDERY MILDEW TO THE FUNGICIDE AZOXYSTROBIN.

Investigator: N. Shishkoff and M. McGrath
Location: Long Island Horticultural Research Laboratory

Azoxystrobin (Quadris, Zeneca Ag Products) is a fungicide in the B-methoxyacrylate class of pesticides, derived from naturally-occurring strobilurins. The purpose of this study was to test its effect on cucurbit powdery mildew isolates from different geographic locations in the US to determine baseline sensitivity and variation in sensitivity. Two-week old squash seedlings ('Seneca Prolific') were sprayed with active ingredient (azoxystrobin 96%) dissolved in methanol: acetone: water (1:1:2 v:v:v)at 0,

PREDICTING LATE BLIGHT

Investigator: D. Moyer
Location: Long Island Horticultural Research Laboratory, Martin Sidor Farm and Ludlow Farms

Late blight has become a threat to Long Island potato and tomato production because of the possibility of importing inoculum on seed potatoes or tomato transplants. This project was to evaluate a late blight forecasting system using the Wisconsin Potato Disease Management Program forecasting software. The disease management module warns growers of the potential for late blight development and recommends proper scheduling of fungicide applications. Three blight forecasting stations were established: on the North Fork, at the Martin Sidor Farm, at Long Island Horticultural Research Lab in Riverhead and on the South Fork, at the Ludlow Farm in Bridgehampton. Weather data from these two locations was entered into the forecasting module twice a week.

A threshold of 18 severity values is used for both prediction of disease development and initiation of control measures. Symptoms are not expected until 7-14 days after 18 severity values accumulate, if the late blight fungus is present. The forecasting system reached 18 severity values May 30 at the LIHRL and South Fork locations and two days later on the North Fork. As was expected, the total severity values accumulated during 1997 (a dry year) were much less than in 1996 (a wet year). No late blight was found on Long Island this year. The forecasting system is useful on Long Island for recommending when to initiate control measures. In addition, blitecast is a valuable tool which provides the growers with guidelines for fungicide spray intervals. This information was disseminated to the growers through the weekly newsletter and a telephone message service.

TOLERANCE AND WEED CONTROL IN SNAP BEANS: EXAMINING THE EFFECTS OF TIMING

Investigators: A. Senesac and D. Moyer
Location: Long Island Horticultural Research Laboratory

Snap beans are a widely grown and important vegetable crop for Long Island. Adequate broadleaf weed control is an essential prerequisite to efficient production and mechanical harvest. For the most part, Long Island growers have found Reflex to be an effective tool for managing weeds in beans. However, some growers have experienced early, severe Reflex-caused injury on some bean varieties. It is unclear if this injury is related to weather conditions, adjuvant use or premature application. Our study evaluated several factors which may influence the occurrence and severity of the injury. Our aim was to determine the optimal combination of rate, crop growth stage and weather conditions that would allow for adequate weed management and minimal crop injury. Last year, at the Long Island Horticultural Research Laboratory, the timing of herbicide application to young unifoliate bean plants, i.e. pre-dawn when the leaves are horizontal and post-dawn when the leaves are vertical, was examined. Our results revealed that Reflex was significantly safened if applied when leaves were vertical. This phenomenon was previously unexamined according to literature searches and personal communications.

This year, three studies again examined treatment time and plant growth stage, for Basagran and Reflex with and without surfactant.

In the first test, Bean variety 'Strike' was planted into Riverhead sandy loam on 5/21/97. Treatments were applied at four different plant growth stages: young unifoliate, unifoliate unfurled, 1st trifoliate, and 2nd trifoliate. Treatments consisted of Basagran 4WS at 0.5 and 1.0 lbs/a a.i. with and without crop oil at 1%; and Reflex

treatments, NewLeaf Superior and an unsprayed treatment. Potato, cv. 'Superior', was planted 30 April. CPB counts were collected from the center five feet of both rows, four to five days after each treatment. Foliar injury ratings were also made on a scale of 0 (no damage) to 10 (complete defoliation). Tuber yields were collected on 26 August.

Fipronil SC (3.8 fl oz/A), Fipronil SC (3.8 fl oz/A), Fipronil SC (3.8 fl oz/A with sprays initiated early followed by 1.9 fl oz/A), Alert 2SC (9.6 fl oz/A), Alert 2SC (9.6 fl oz/A followed by one application of Provado at 3.75 fl oz/A) and New Leaf Superior provided the best control of CPB based on counts of large larvae (season means), but were not significantly different from Admire in furrow (13.8 fl oz/A followed by Agri-Mek at 8 fl oz/A) and Provado (3.75 fl oz/A with sprays initiated early). Agri-Mek (8 fl oz/A followed by Provado at 3.75 fl oz/A) and SpinTor (6 fl oz/A) provided good control but not as effective as the previously mentioned materials. ABG6473, a Bt, (3 and 4 qts/A) and Provado (3.75 fl oz/A with sprays initiated after 3rd instar occurred) provided the poorest control of the chemical treatments but resulted in significantly lower numbers of large larvae than the no chemical treatment. The NewLeaf Superior provided the best protection from the CPB with zero percent defoliation. All treatments resulted in significantly less defoliation (18 July) than the untreated. However, both rates of ABG6473 had defoliation ratings above 20%.

MONITORING AND CONTROL OF BLACK CUTWORM IN POTATOES

Investigator: D. Moyer and D. Gilrein
Location: Commercial Potato Farms

Objectives of this study included: 1) to evaluate blacklight traps and two types of pheromone traps for monitoring black cutworm (BCW) in potatoes and 2) to determine the best timing of sprays for the control of BCW in potatoes. Two types of pheromone traps, wing and Heliothis, and blacklight traps were monitored twice a week for trapped moths from late May through early September. Insecticide applications for BCW control were timed according to moth trap counts from the second peak flight at two commercial farms. Three treatments were replicated four times in a randomized block experimental design. In the first treatment, a single insecticide application was made one week after peak moth flight. For the second treatment, two insecticide applications were made, the first a week after peak moth flight followed by a second 7 to 10 days later. A third treatment was left unsprayed as a control.

Two peak moth flights were observed during the season, the first in June around tuber initiation, and the second from mid- to the late July when damage to the tubers is more likely. At 3 of the 4 locations Heliothis traps caught higher numbers of BCW than the wing traps during the "critical" period of second peak flight. Blacklight traps caught a few more moths at one location and slightly lower numbers at the other location compared to the Heliothis traps.

At the South Fork location, neither one nor two insecticide sprays significantly reduced tuber damage compared to the unsprayed plots (0.8% tuber damage for both sprayed treatments vs 1.1% tuber damage). At the North Fork location both insecticide treatments resulted in significantly less tuber damage than in the unsprayed plots (1.7% tuber damage), but there was no difference in tuber damage between plots sprayed with one (0.3% tuber damage) or two (0.1% tuber damage) applications of the insecticide.

This project was supported by Friends of Long Island Horticulture.

P73-2, Q3-12 and Q8-2. NY103 and NY115 had the best tuber appearance. Other lines with attractive tuber type were NY109, NY110, P32-3 and Q3-12.

RUSSET AND COLORED SKIN POTATO CLONES

Investigators: J. Sieczka, D. Gergela, M. Masierowska, R. Neese and D. Moyer
Location: Long Island Horticultural Research Laboratory

Selections of russet- , red- and purple-skinned clones from Cornell and USDA programs were evaluated in two experiments. Both experiments were harvested as if the lines were main season maturity even though some selections mature early.

Red-skinned Clones: Chieftain, Redsen and Red Ruby produced similar marketable yields. Redsen had the most intense red color and the best appearance. Tubers of B0811-4 are very small, have a pink smooth skin and yellow flesh. This line could fit a niche market even though its yield is very low. Other lines that may fit niche markets are B0811-13 (red netted skin with yellow flesh), R174-1 (purple skin and mottled purple flesh) and R174-2 (smooth red skin with pink mottled flesh).

Russet-skinned Clones: The yield of tubers greater than eight ounces was poor for all entries. The performance of Century Russet was disappointing. The best yielding russet was B9922-11. This line has golden nematode resistance. Tubers are oblong to long, heavily netted and have a high specific gravity. Although not a major problem in this experiment, hollow heart has been a concern in a cultural practice experiment this year and other experiments in the past.

Ph EFFECT ON OAT COVER CROP

Investigators: J. Sieczka, M. Masierowska and D. Gergela
Location: Long Island Horticultural Research Laboratory

Oats were planted in the area of the long term pH study as a mulch crop for a pumpkin evaluation. Unfortunately, the pumpkin experiment was abandoned due to emergence problems and wildlife feeding on the plants.

Plant stand, vigor, weight and mineral analysis data were collected on the oats. Plant stand was not effected by pH or previous zinc treatments. However, vigor, total weight, weight per plant and mineral composition were effected by pH level. At the natural pH of about 4.6, the oats were weak and showed symptoms of magnesium and nitrogen deficiency. At target pH of 7.0, plants were tall but exhibited manganese deficiency symptoms. The fresh weight of plants grown at target pH levels of 6.0 and 7.0 was the highest. However, the dry weight of plants grown at 7.0 was significantly lower than those grown at pH 6.0. The visual observations of the plots suggested that the plants in the 7.0 plots were more succulent than those in the other treatments. Mineral composition of the oats was somewhat variable, however, the following trends were observed as pH increased: the plant manganese levels decreased marketably, the boron and zinc levels dropped slightly (the zinc content of plants was consistantley higher in the plots that received zinc in 1992), and phosphorus, potassium and magnesium increased slightly.

INSECTICIDE MANAGEMENT OF THE COLORADO POTATO BEETLE: 1997

Investigator: D. Moyer
Location: Long Island Horticultural Research Laboratory

The objective of this study was to compare the efficacy of several insecticides and NewLeaf Superior for the control of Colorado potato beetle on potatoes. Plots consisted of two 20-ft. rows on 34-inch centers; a unplanted guard row buffered each plot. Treatments were replicated 4 times in an RCB design. There were 12 insecticide

at planting. Sidedress applications of 50, 100 and 185 lbs N/A were made when plants were 4 to 6 inches tall (6/5 & 6/97). Seed pieces were spaced at 8, 10 and 12 inches. Harvested data were collected on 10/7/97.

The transgenic line was more vigorous and later maturing than the standard Superior. The maturity of the transgenic line was delayed by high nitrogen. The total yield of the transgenic line was significantly greater than the standard, but the marketable yield was significantly lower. The higher nitrogen rates reduced marketable yields of the transgenic line while the yield of the standard line tended to increase as nitrogen rates increased. Tuber appearance of the transgenic line was poor regardless of the nitrogen treatment. Both entries were affected by pinkeye disease that reduced marketable yield, however, the amount of pinkeye and misshapen tubers was greater in Superior SPBT 02-05. There was a marked difference in the tuber shape of the two lines. The standard Superior tubers were primarily oblong to round while tubers of the transgenic Superior were oblong to long, with many tubers looking like white-skinned Russet Burbanks.

EARLY WHITE-SKINNED POTATO CLONES

Investigators: J. Sieczka, D. Gergela, M. Masierowska, R. Neese and D. Moyer
Location: Long Island Horticultural Research Laboratory

The early season experiment was planted on April 15, 1997 and roto cut on August 11th and harvested on August 20, 1997.

There were no significant differences in total yield and marketable yield between Andover, Superior N1 (standard Superior obtained from Nature Mark), AF1470-6, AF1475-20, Reba (NY87), NY109 and NY110. The best appearing lines were Andover, Reba, NY109, and NY110. Tubers of AF1475-20 and NY110 had the highest specific gravity. Tubers of AF1437-1 and AF1470-6 had low specific gravity. Internal necrosis was observed in tubers of AF1470-6, AF1475-20 and NY109.

MAIN SEASON WHITE-SKINNED POTATO CLONE EVALUATION

Investigators: J. Sieczka, D. Gergela, M. Masierowska, R. Neese and D. Moyer
Location: Long Island Horticultural Research Laboratory

Three main season white-skinned potato variety evaluations were conducted in 1997. Seed for the experiments were obtained from Regional Project NE184, Cornell University, USDA and the University of Maine.

NE184 Clones: The marketable yields of Katahdin, Atlantic and B0766-3 were not significantly different from each other. NY103 tubers were the most attractive and AF1615-12 and Reba tubers had good appearance. Specific gravity of Atlantic and NY102 tubers was high. Internal defects were severe in Atlantic, Yukon Gold, and AF1480-5.

The University of Maine and USDA Seedlings: AF1714-2 and B1240-14 produced marketable yields significantly lower than Katahdin. All other entries produced marketable yields not significantly different from Katahdin. The specific gravity of B1240-14 tubers was considerably higher than the others. The best looking lines were B0564-9, B1240-12 and B1429A-6. Severe internal defects were noted in tubers of AF1773-1, B1240-14 and B1429A-6.

Cornell Clones: Allegany, Norwis, NY103 and NY109 produced the best marketable yields. Norwis, NY103, and Q3-12 tubers were the largest in the experiment. Entries that had specific gravity readings greater than 1.080 were: Allegany, P32-3, P63-1,

POTATOES

CLONE X N RATE X SPACING

Investigators: J. Sieczka, D. Gergela, M. Masierowska and D. Moyer
Cooperators: D. Halseth, R. L. Plaisted, and K. Haynes
Location: Long Island Horticultural Research Laboratory

Experiments to determine the effect of nitrogen rate and spacing on vigor and yield of NY103, NY109 and B9922-11 were established on 4/23/97. All plots were fertilized at a rate of 1,000 lbs/A of 10-20-20 in bands of planting. Sidedress nitrogen treatments of 0, 50, and 100 lbs/A were applied on 6/4/97. Spacing treatments were 6 and 9 inches.

NY103. The highest total and marketable yields were produced at the six inch spacing and sidedress rate of 100 lbs N/A. However, the only significant effect was that of spacing on total yield. Size distribution and specific gravity were not affected by treatment.

NY109. Total and marketable yields were highest at the 100 lbs N/A sidedress rate and six inch spacing but the yields at 0 and 50 lbs N/A sidedress rates were nearly identical. The nine inch spacing resulted in a higher percentage of tubers greater than 2.5 inches than the six inch spacing. Specific gravity was not affected by treatment.

B9922-11. Total and marketable yields increased when sidedress nitrogen was applied but the 50 and 100 lbs N/A rates produced similar yields. Yields were not affected by spacing. There was no hollow heart at the six inch spacing and no sidedress. The amount of hollow heart was greatest at the nine inch spacing.

This project was supported by Empire State Potato Club

REDSEN EARLY HARVEST X N RATE

Investigators: J. Sieczka, D. Gergela and M. Masierowska
Location: Long Island Horticultural Research Laboratory

An experiment to determine the effect of nitrogen rate on early and normal harvest dates of Redsen potatoes was established on 4/16/97. All plots received 0-200-200 lbs/A and nitrogen rates of 50, 100 or 150 lbs/A at planting. Early plots were harvested 89 days after planting and late plots 117 days after planting.

Unlike the results obtained in 1996, there were no significant differences in yield between harvest dates in 1997. The total and marketable yields were almost identical between plots harvested 89 days and 117 days after planting. Yields increased as nitrogen rates increased from 50 to 150 lbs/A. Even though this experiment was irrigated, the hot, dry conditions in June and July retarded growth to a point where the late harvested plants were not able to benefit from the longer season. In 1996, there were no differences in yield due to N rate at the early harvest, but the yield of the late harvested treatments increased as N rate increased.

TRANSGENIC SUPERIOR X SPACING X N RATE

Investigators: J. Sieczka, D. Gergela, M. Masierowska and D. Moyer
Location: Long Island Horticultural Research Laboratory

The effect of nitrogen sidedress rate and spacing on yield and quality of standard Superior and the transgenic Superior line, SPBT 02-05, was investigated in an experiment planted on 4/22 & 23/97. All plots received 100-200-200 lbs/A in bands

Sinclair and Vancouver produced significantly more total marketable leaf tissue than the others. Sinclair and Vancouver produced significantly more leaf tissue free of white rust than the others.

IMPACT OF AMBIENT OZONE ON SENSITIVE AND TOLERANT SNAP BEAN VARIETIES

Investigator: M. T. McGrath
Location: Long Island Horticultural Research Laboratory

Strike, an ozone-resistant variety, and Oregon91, an ozone-sensitive variety, of snap bean were grown outdoors in open-top chambers with charcoal-filtered or non-filtered air to assess the impact of ambient ozone on plant growth. Open-top chambers are cylindrical structures, 10-ft in diameter, with clear plastic sides and fans to blow air in. Beans were seeded on 12 Jun in the greenhouse, transplanted on 30 Jun into the field, and chambers were set-up on 12 Jul. Beans were hand-watered 3 times a week when there was no rain. Pods were harvested on 7 Aug. Entire plants were harvested on 27 Aug. Leaves and pods were weighed separately. Both wet and dry weights were measured.

Ozone-induced foliar injury was first observed on 6 Aug. Extensive injury had developed on Oregon91 by 27 Aug. Very little injury was observed on Strike. Growth of Oregon91 was affected by ozone. Dry weight of pods from plants grown in non-filtered chambers was reduced by 39% compared to plants grown in filtered chambers. Weight of leaves and stems was reduced by 32%.

SUMMARY OF VEGETABLE DISEASE DIAGNOSES

Investigator: M. T. McGrath
Location: Long Island Horticultural Research Laboratory

Only 39 samples were submitted to the laboratory for diagnosis in 1997, perhaps reflecting dry conditions. IPM scouts brought in 13 of the samples. Bacterial canker of tomato was an important problem for several growers. Powdery mildew, a new disease of tomato, occurred in both greenhouse and field production. Phytophthora crown rot of pumpkin was observed early (24 Jul) where heavy rains had occurred. Additional diagnosed diseases and nonpathological problems include: Stewart's bacterial wilt of sweet corn, tomato spotted wilt virus (TSWV) affecting pepper, bottom rot on endive, oedema on collard greens, and root lesion nematode affecting potato tubers.

rows of each plot by cutting just below the crown. Plants with white rust were counted. Leaves with white rust were removed, counted and weighed.

Conditions were not conducive for white rust development during most of this experiment. There were only six days with rain from 5 Sep, when plants were in the cotyledon stage, through 30 Oct. White rust was first observed on nontreated Seven R on 7 Oct, 1 wk after 0.63 in. of rain fell. Severity remained very low until 5 Nov, after a total of 1.68 in. of rain on 25 and 27 Oct. Both approaches for managing white rust were effective. There was less white rust on the resistant varieties (Fall Green and Vancouver) and on fungicide-treated Seven R compared with nontreated Seven R. Aliette alone was the least effective chemical. Maneb and Syllit were the most effective chemicals based on white rust incidence (all other differences among Maneb, Syllit and treatments with Kocide were insignificant). Maneb and Syllit were the only fungicides tested that are not registered on spinach in the U.S.. Chemical control with Kocide, Kocide + Aliette, Maneb, or Syllit was more effective than resistant varieties in reducing white rust incidence and severity (% A Grade leaf tissue with symptoms). Estimated fungicide benefit (value of yield gain - cost of fungicide treatment) ranged from $1,173/A for Kocide + Aliette to $1,307/A for Syllit.

WHITE RUST OF SPINACH: Comparison of Fungicides for Control of White Rust on Spinach

Investigator: M. T. McGrath
Location: Long Island Horticultural Research Laboratory

Spinach variety 'Seven R' was seeded on 29 Aug. Treatments were applied weekly from 25 Sept to 5 Nov, for a total of seven applications with a backpack sprayer and hand-held boom that delivered 40 gpa at 50 psi. On 13 Nov, 15 plants were harvested from the middle rows of each plot by cutting just below the crown. Plants with white rust were counted. Leaves with white rust were removed, counted and weighed.

Conditions were not conducive for white rust development during most of this experiment. White rust was not observed until 5 Nov. All treatments suppressed white rust compared with the nontreated control. Spinach treated three times with Ridomil Gold/Copper at 2.5 lbs/A followed by four applications of Ridomil Gold WSP at 0.25 lbs/A had the least disease. White rust was observed on 6-31% of the treated plants and 95% of the nontreated plants. Weight of leaves with white rust was 2-7% and 35% of the total marketable weight for treated and nontreated plants, respectively. The new formulation of Kocide (4.5LF) was as effective as Kocide 2.4LF.

WHITE RUST OF SPINACH: Variety Evaluation

Investigator: M. T. McGrath
Location: Long Island Horticultural Research Laboratory

The objective of this study was to compare seven commercially available spinach varieties from Asgrow Seed Company. Seven R was included as a standard susceptible variety. The other varieties tested have exhibited some tolerance to white rust in other experiments and have resistance to at least races 1 and 3 of *Peronospora farinosa* f. sp. *spinaciae* (downy mildew). Fidalgo and Vancouver have a smooth leaf type; the others are semi-savoyed. Spinach was planted on 29 Aug and harvested on 21 Nov.

Conditions were not conducive for white rust development during most of this experiment. Symptoms were first observed on Seven R on 5 Nov. Sinclair, Fidalgo, Vancouver, and San Juan exhibited white rust resistance compared to Seven R based on both disease incidence and percent of marketable leaf tissue with white rust. Cypress and Orcas did not have significantly less disease than Seven R. Seven R,

Powdery mildew and early blight were first observed on 14 Aug, one day before the first harvest. Powdery mildew became quite severe in nontreated plots and was more important than early blight in the fungicide-treated plots. On nontreated plants 26 days later, 60% of leaves were dead almost exclusively due to powdery mildew. All three fungicide programs controlled powdery mildew well on the upper surface of leaves but only moderately on lower leaf surfaces. This indicates the need for a systemic fungicide to manage powdery mildew. TOM-CAST 15 DSV, with 7 sprays, was as effective as the weekly spray program, with 12 sprays, for controlling both diseases. Early blight was significantly more severe with TOM-CAST 25 DSV (5 sprays) than with the weekly program. This experiment has documented that with TOM-CAST 15 DSV foliar diseases in staked fresh-market tomatoes can be effectively controlled while maintaining yield with substantially fewer fungicide applications than a weekly spray program. A grower applying Bravo Ultrex at 1.5 to 2.75 lb/A according to TOM-CAST 15 DSV would have made 5 less applications thereby saving $141.50/A and using 12.5 lb/A less fungicide over a weekly spray program in 1997.

EVALUATION OF PLASTIC MULCH AND STAKING FOR MANAGING FRUIT ROTS IN FRESH-MARKET TOMATOES

Investigator: M. T. McGrath
Location: Long Island Horticultural Research Laboratory

The primary disease of interest was buckeye rot. Therefore this experiment was conducted in a field where *Phytophthora capsici* had been fairly severe on pumpkin and summer squash in 1996. 'Sunrise' seedlings were transplanted on 18 Jun into raised beds with drip irrigation. A split-plot design was used. The whole plot treatment was Ridomil Gold (1.5 pt/treated A) applied through drip irrigation on 16 Jul for buckeye rot control. The subplot treatment was planting method: bare ground, 5-ft black plastic mulch laid over the row, and plastic mulch plus staking to position plants off the ground. The field was overhead irrigated on 18 Sep and 3, 7, 10, and 14 Oct to create conditions favorable for Phytophthora fruit rot development by saturating the soil. Fruit were harvested when fully ripe to provide ample opportunity for disease development.

Conditions were dry and thus not favorable for development of Phytophthora fruit rot during most of the experiment. Excessive irrigation did not result in development of this disease. Rhizoctonia fruit rot and anthracnose were the primary fruit diseases observed. Tomatoes grown on raised beds with black plastic mulch and staked to keep the plants upright produced significantly more marketable fruit than tomatoes on bare ground (5.9 fruit/plant). The value of this yield gain is $7196/A, based on 4356 plants/A and a price of $7 for a 25-lb box of tomatoes. This greatly exceeds the estimated cost of $800-1000/A to grow tomatoes with plastic mulch, drip irrigation, and staking. Using plastic mulch without staking resulted in a significant reduction in the percentage of rotting fruit/plant over bare ground. Staking plants yielded an additional significant disease reduction. Ridomil Gold did not significantly affect the quantity of marketable or rotting fruit, which was not surprising considering that Phytophthora fruit rot was not observed.

WHITE RUST OF SPINACH: Comparison of Fungicides and Resistant Varieties for Control of White Rust on Spinach

Investigator: M. T. McGrath
Location: Long Island Horticultural Research Laboratory

Spinach was seeded on 29 Aug. Treatments were applied weekly from 25 Sept to 5 Nov, for a total of seven applications with a backpack sprayer and hand-held boom that delivered 40 gpa at 50 psi. On 13 Nov, 15 plants were harvested from the middle

the first third of the harvest period (3.3 vs 2.6 fruit/plant), thereby confirming previous criticisms of this variety, however, X3R Camelot produced significantly more fruit than Camelot during the other harvests (1.8 vs 3.6). Enterprise was the highest yielding variety (7.7 fruit/plant)

This project was supported by the Friends of Long Island Horticulture.

RACES OF *XANTHOMONAS CAMPESTRIS* PV. *VESICARIA* ON PEPPERS FROM THREE NORTHEASTERN STATES

Investigators: N. Shishkoff and M. McGrath
Location: Long Island Horticultural Research Laboratory

To determine what races of bacterial leaf spot (BLS) were present in pepper in the northeastern US, 76 isolates were collected from 16 sites in NJ, CT, and MA (NY isolates were to have been included, but no BLS outbreaks were identified from NY). Bacterial races were determined using differential pepper lines. Each isolate, along with known isolates of races 1-4, were prepared at 1×10^9 cfu in sterile distilled water and infiltrated into the intercellular spaces of pepper leaf mesophyll using a disposable 10 ml syringe (with needle removed). After 48 hours, leaves were examined for a hypersentive response (the collapse of infiltrated tissue). After an additional 48 hours, the compatible response was visible: a yellow halo around the infiltrated areas.

Most isolates tested were either race 3 or race 1. At two sites in CT isolates did not cause a hypersensitive response in the differential pepper cultivars; this response is characteristic of race 6 isolates. The presence of race 6 bacteria would be significant since no pepper cultivars resistant to this race are known. These isolates will be studied further to confirm their identity.

This project was supported by the Friends of Long Island Horticulture.

FOLIAR DISEASE CONTROL IN TOMATO WITH TOM-CAST, A WEATHER-BASED DISEASE FORECASTING SYSTEM

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

Two versions of TOM-CAST were compared to a weekly spray program for managing early blight in fresh-market tomatoes. This forecasting system calculates daily disease severity values (DSVs) from hours of leaf wetness and average temperature when leaves were wet. All three spray programs were started after 38 DSVs had accumulated from transplanting, which was 1 month before symptoms of foliar diseases were seen and the first harvest. Timing of subsequent sprays was as follows: for TOM-CAST 15 DSV, fungicide was applied after 15 DSVs had accumulated *or* after 2 wks *or* if rain was forecast and either of these conditions were almost met; for TOM-CAST 25 DSV, fungicide was applied after 25 DSVs had accumulated *or* after 3 wks when early blight symptoms had not been seen *or* after 2 wks when disease was present *or* if rain was forecast and any of the previous conditions were almost met. On 10 Jun, 39-day-old seedlings were transplanted at 24-in. plant spacing into raised beds with black plastic mulch and drip irrigation. Plants were pruned and staked. On both sides of the plots were guard rows that were transplanted on 6 Jun and inoculated with the early blight fungus. Treatments were applied with a tractor-mounted boom sprayer that delivered 91 gpa at 100 psi and was equipped with five D3-45 hollow cone nozzles per row with one nozzle centered over the row and two drop nozzles on each side of the row. Severity of early blight and powdery mildew was recorded weekly. Ripe fruit were harvested weekly from 15 Aug - 16 Oct.

BACTERIAL LEAF SPOT OF PEPPER: EVALUATION OF BACTERICIDE PROGRAMS INITIATED AFTER DISEASE DETECTION

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

The objectives of this study were to determine if bacterial leaf spot (BLS) can be managed effectively with a copper fungicide/bactericide (1) when applications were initiated after disease detection and (2) when the spray interval was lengthened under unfavorable disease conditions (night temperature <60 F). Seedlings were transplanted on 5-6 Jun into raised beds with black plastic mulch and drip irrigation. A spreader row in the field center was inoculated on 7 and 11 Jul with pathogen races 1, 2, and 3. For most treatments, Kocide 2000 (2 lb/A) was tank mixed with Maneb 75DF (1.5 lb/A) and agitated for 90 min which reportedly increases the amount of copper in solution. Treatments were applied with a tractor-mounted boom sprayer that delivered 100 gpa at 250 psi. Fruit were harvested every 6-8 days from 4 Aug to 8 Oct. BS severity and defoliation due to BS were recorded.

BLS development was slowed by the dry weather. Yield of nontreated plants was not significantly less than that of treated plants until the late harvests (16 Sep to 8 Oct). BLS was managed as effectively with an IPM program (applications started on 29 Jul after disease detection and delayed when <60F at night) as with a preventive spray program. This IPM program saved 3 sprays in Jul and 2 sprays in Sep. The 2 sprays made in Sep for the IPM program were needed to maintain yield. Peppers sprayed from disease detection through 30 Aug (5 sprays) did not produce significantly more fruit than nontreated peppers. Kocide applied alone without extra agitation was as effective as Kocide + Maneb. Harvesting is restricted by a 7-day PHI when Maneb is used. The cost of controlling BLS with Kocide ($126/A for 9 sprays at $7/A for Kocide and $7/A application cost) was much less than the value of the yield gain ($929/A assuming 60% of fruit are marketed at $7.50/box).

This project was supported by the Friends of Long Island Horticulture.

BACTERIAL LEAF SPOT OF PEPPER: COMPARISON OF RESISTANT VARIETIES AND CHEMICAL CONTROL

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

Seven pepper varieties with resistance to races 1, 2, and 3 of bacterial leaf spot (BLS) were evaluated for their ability to resist disease and their yielding ability. Camelot was included as a standard susceptible variety for comparison. To provide a source of disease, Camelot was grown between the plots and inoculated with races 1, 2, and 3 of BLS. Half of the plots were sprayed 12 times on a 7-day interval from 8 Jul to 26 Sep with Kocide 2000 at 2 lb/A tank mixed with Maneb 75DF at 1.5 lb/A. This was done to be able to compare chemical control to genetic control (treated Camelot vs nontreated X3R Camelot) and to be able to determine if there is a benefit to spraying BLS-resistant varieties.

Kocide + Maneb applied weekly on a preventive schedule did not have a significant positive impact on yield during any of the three harvest periods. BLS-susceptible Camelot treated weekly with Kocide + Maneb did not yield significantly more than nontreated Camelot. Host plant resistance was a more effective way to manage BLS than chemical control. Nontreated X3R Camelot had fewer symptoms of BLS than treated Camelot (0.4% vs 10.5% severity on 28 Aug) and produced significantly more fruit (6.7 vs 5 fruit/plant and 3.3 vs 2.3 lb/plant). Planting X3R Camelot was less costly than chemical control with Camelot ($144/A additional seed cost vs $288/A for 12 applications). Camelot produced significantly more fruit than X3R Camelot during

EFFECT OF ORGANIC AND PLASTIC MULCHES ON INCIDENCE OF PUMPKIN FRUIT ROT CAUSED BY *PHYTOPHTHORA CAPSICI*

Investigators: N. Shishkoff and M. McGrath
Location: Long Island Horticultural Research Laboratory

Phytophthora fruit rot occurs in warm wet weather when swimming spores (zoospores) are released and spread by moving water. Since pumpkin fruit sit in direct contact with the soil, reducing the number and spread of zoospores at the soil surface might increase yields even in fields where the pathogen was present. An experiment to study the effect of surfaces mulches on disease development was conducted in a field where Phytophthora fruit rot of pumpkin had developed in 1994 and 1996. Treatments were conventional tillage, oat straw mulch, cocoa shell mulch and black plastic mulch. A randomized complete block design with five replications was used. To reduce plot-to-plot interference, test plots (18- x 6- ft)alternated with plots planted to sorghum (22- x 6-ft) in a checkerboard pattern. On July 11 cocoa shell mulch and oat straw was laid at a thickness of 3/4 inch (7 ft^3/plot) and black plastic mulch was used in a manner typical for commercial production; control treatments received no mulch. After mulching, 3-week-old bush-type pumpkin plants ('HMX 2692') were transplanted 8 per plot. The field was irrigated (approx. 1.0 in.) when soil was dry due to inadequate rainfall from Jun to early Sep (7 times total), then the field was irrigated frequently and often excessively (0.5-2.7 in.) during late Sep and Oct to create conditions favorable for Phytophthora fruit rot development by saturating the soil and providing opportunity for splash dispersal from infected fruit. Fruit were examined weekly 8 Sep - 20 Oct for symptoms of Phytophthora fruit rot and other diseases.

Phytophthora was first observed on 20 Aug in plastic mulch treatments. It developed in all treatments, although severity varied tremendously within treatments, making statistical analysis difficult. Plastic mulch plots had, on average, more disease than other treatments (see Table below). Total yield (which remained much the same after Oct 7) did not differ significantly among treatments.

Treatments	Mean Diseased Fruit/plant			Mean Yield (fruit/plant)
	7 Oct	14 Oct	20 Oct	14 Oct
Control (rototilled)	9.4	10.4	10.6	34.6
Oat straw mulch	4.8	4.8*	6.4**	33.0
Cocoashell mulch	1.6	4.4*	8.8**	36.8
Black Plastic mulch.....	19.0	22.3	24.7	41.0
P-value	0.30	0.21	0.24	0.39

* Oatstraw and cocoashell mulch treatments differed from plastic mulch treatment by P=0.07 and 0.06, respectively, by a means comparison test.

** Oatstraw and cocoashell mulch treatments differed from plastic mulch treatment by P=0.06 and 0.10, respectively, by a means comparison test.

This project was supported by the Friends of Long Island Horticulture.

Treatment and Rate/A	Disease Incidence (Symptomatic Plants/Total) Fruit Rot (%)* 14 Oct	20 Oct	Tip Blight (%)* 14 Oct	20 Oct
Nontreated Control.....	33.0 a	56.0 a	39.8 a	31.0 a
Ridomil Gold (1 pt/A)...	9.5 ab	15.7 b	4.0 a	2.0 b
Acrobat (2.25 lb/A).....	2.0 b	29.0 ab	16.0 a	14.5 a
P-value	0.043	0.024	0.15	0.07

*Analysis of variance was done on log-transformed data; percentages followed by different letters differed significantly according to Fisher's Protected LSD (p=0.05).

PHYTOPHTHORA FRUIT ROT OF PUMPKIN: EVALUATION OF OAT STRAW MULCH AND RYEGRASS LIVING MULCH

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

Treatments were conventional tillage, oat straw mulch, and ryegrass living mulch. Oats were planted on 11 Apr. The ryegrass and tilled plots were rototilled. Oats were killed by applying Round-up herbicide when they were flowering on 18 Jun. Pumpkin was direct-seeded on 27 Jun. All plots were subsoiled on 29 Jul between the rows to improve drainage for Phytophthora management. Ryegrass (95 lb/A) was planted on 30 Jul by broadcasting seed around the pumpkin plants, then raking the seed in. The field was irrigated frequently and often excessively during late Sep and Oct to create conditions favorable for Phytophthora fruit rot development. Fruit were examined weekly.

The ryegrass formed a thick mulch between the rows of pumpkin, but it did not grow within the rows. There were a lot of fibrous roots underneath the fruit in the ryegrass plots. The ryegrass was sufficiently tall (12-16 inches) in Oct that these medium-small fruit (6 lb) were partially covered. There were fewer orange fruit in the ryegrass plots than in the others; however, this difference was not statistically significant. Most of the oat straw remained standing throughout the growing season. Some oat reseeding occurred. Pumpkin plants in the oat straw plots grew more slowly and the fruit turned orange later than in the other plots. There were significantly more green fruit in the oat straw plots than in the others on 8 Sep. Phytophthora was first observed on 20 Aug in 2 of the 4 ryegrass mulch plots. Phytophthora developed in all treatments. This disease developed more slowly than expected under frequent irrigation. Almost all fruit rot due to Phytophthora started where fruit touched soil; very few symptoms resulting from splash dispersal were seen. There were no significant differences among the treatments at any time.

This project was supported by the Friends of Long Island Horticulture.

PHYTOPHTHORA FRUIT ROT OF PUMPKIN: SUSCEPTIBILITY OF HARD-RINDED AND CONVENTIONAL PUMPKINS

Investigators: M. McGrath
Location: Long Island Horticultural Research Laboratory

This experiment was undertaken to evaluate an experimental pumpkin with a hard, gourd-like rind (HMX 4696) that seemed to be less susceptible than adjacent squash in an observational study in 1996. Four experimental pumpkins were evaluated which produce mini-sized fruit. Four-wk-old seedlings were transplanted on 11 Jul at 24-in. plant spacing. Plots consisted of two rows with seven plants each. The field was irrigated frequently and often excessively (0.5-2.7 in.) during late Sep and Oct to create conditions favorable for Phytophthora fruit rot development by saturating the soil and providing opportunity for splash dispersal from infected fruit. Fruit were examined weekly from 8 Sep through 5 Nov for symptoms of Phytophthora fruit rot and other diseases. On 22 Oct, 20 healthy fruit of each experimental were removed from the field. They were put in enclosed plastic containers, misted with water, then *Phytophthora* sporangia from a naturally infected pumpkin fruit were put on each one.

Substantial differences in susceptibility to *Phytophthora* were detected. The two experimentals with hard rinds (HMX 4695 and HMX 5682) were much less susceptible than the other two experimentals tested. Symptoms were first observed on 15 Sep in HMX 4696 and on 22 Sep in HMX 2692, but not until 5 Nov in HMX 4695 and HMX 5682. The percentage of fruit with no symptoms of disease on 5 Nov were 64%, 50%, 97%, and 93% for these experimentals, respectively. HMX 4695 and HMX 5682 also appeared to be less susceptible when inoculated. *Phytophthora* developed on none of the HMX 4695 fruit and all of the HMX 2692 fruit.

This project was supported by the Friends of Long Island Horticulture.

EVALUATION OF FUNGICIDES FOR PHYTOPHTHORA FRUIT ROT AND TIP BLIGHT OF SUMMER SQUASH

Investigator: N. Shishkoff and M. McGrath
Location: Long Island Horticultural Research Laboratory

A field experiment was conducted to determine if Acrobat MZ (dimethomorph + mancozeb), a fungicide that is effective in controlling late blight of potato, had any fungicidal effects against fruit rot and tip blight of squash caused by *Phytophthora capsici*. Three-wk old squash seedlings ('Multipik') were transplanted 18 Jul to a field that in 1996 had pumpkin with fruit rot. The field was heavily irrigated (1-1.5 in.) six times from Aug-Oct to provide favorable conditions for *Phytophthora*. Rainfall (in.) was 2.53, 3.97, and 1.20 for Jul, Aug, and Sep, respectively. Treatments were started on 31 Jul, just before conditions that had led to disease in previous years. Acrobat MZ (2.25 lb/A) was applied weekly and Ridomil Gold (1 pt/A) biweekly beginning 31 Jul and ending 17 Oct using a CO_2-pressurized backpack sprayer and hand-held boom delivering 40 gpa at 50 psi. A randomized complete block design with four replications was used. Phytophthora was first observed in control plants on 7 Oct. On 14 and 20 Oct, plants with unmistakable symptoms of fruit rot or vine tip blight were counted.

Both fruit rot and tip blight were more severe in untreated plots. Acrobat MZ protected fruit as well or better than Ridomil Gold, but was not as effective in protecting vine tips from blight. Good coverage would be more important for Acrobat MZ than Ridomil Gold because dimethomorph, the a.i. in Acrobat MZ, is only translaminarly systemic whereas mefenoxam, the a.i. in Ridomil can also move acropetally when taken up by roots. Superior spray coverage could be obtained with a high pressure sprayer, which might result in better disease control.

The first naturally-occurring infections of powdery mildew at the LIHRL were observed on July 21, which is unusually late for this region. Cleistothecia on inoculated plants were only observed on leaves of the second planting on Sept 4 (4 out of 22 inoculated leaves). Inoculated leaves lived 13-44 days after inoculation; inoculated leaves experienced average temperatures of 21.7-22.4 C, 20.5-21.2 C, and 17.9-20.1 C for the 1st-3rd planting dates, respectively. As in previous years, the difference in temperature experienced by leaves of different plantings dates did not appear sufficient to influence cleistothecium development (which, in the laboratory, form at temperatures from 18-24 C).

HOST RANGE OF THE CUCURBIT POWDERY MILDEW FUNGUS

Investigator: N. Shishkoff
Location: Long Island Horticultural Research Laboratory

Although the powdery mildews on cucurbits and composites are considered to belong to the same species (*Sphaerotheca fuliginea* or *S. fusca*, depending on which authority is consulted), it has never been clear whether the cucurbit powdery mildew had alternate hosts on which it could overwinter. Laboratory host range studies from 1995-1997 have shown that the cucurbit powdery mildew can infect diverse hosts, including clover, bean, sunflower, okra, verbena and violet. However, because laboratory host range tests may give an unrealistic picture of what really happens under natural conditions, in 1997 a number of test plants were grown among straightneck squash 'Seneca Prolific' in the field to see if any developed powdery mildew infections. Planted were Beggar's tick, *Verbena*, *Salvia*, snapdragon, okra, bee balm, *Cetranthus*, *Veronica*, clover, penstemon, pot marigold, and hyacinth bean. Only *Verbena* developed powdery mildew. The mildew on *Verbena* readily infected squash, and more importantly, produced cleistothecia when paired with a cucurbit powdery mildew isolate. Local nurseries were searched for additional mildew isolates from *Verbena*; a second isolate also infected cucurbits.

IDENTITY OF THE CUCURBIT POWDERY MILDEW

Investigator: N. Shishkoff
Location: Long Island Horticultural Research Laboratory

To clarify the relationships among mildews on composites, cucurbits and other plant families, 216 collected and herbarium specimens of powdery mildews considered to be *Sphaerotheca fuliginea sensu lato* from a variety of host plants were examined. It became apparent that *S. fuliginea sensu stricto*, found on species of *Veronica*, was morphologically distinct from mildews on composites and cucurbits. The mildews on composites ap-peared to correspond well to the species delimited by Junell in her 1966 monograph: *S. fusca*, *S. xanthii*, and *S. erigerontis-canadensis*. The mildew on cucurbits was morphologically similar to *S. verbenae* and *S. xanthii*.

A mildew had been described for *Verbena*, *Sphaerotheca verbenae* , in 1953. Nagy and Albert (1977) had reported cross-inoculation between mildews on cucurbits and *Verbena*, but Boesewinkel (1977) reported that morphological differences in the conidiophores readily distinguished the two fungi. To verify this, cleared and stained material of the cucurbit powdery mildew, two isolates of mildew collected from *Verbena*, and various herbarium specimens were examined; no morphological differences were found. Based on morphological similarity as well as host range evidence (see above, **Host range of the cucurbit powdery mildew fungus**), the cucurbit powdery mildew will probably turn out to be *S. verbenae* or *S. xanthi* (a mildew found on sunflower).

POWDERY MILDEW OF PUMPKIN: DISEASE REACTION OF RESISTANT EXPERIMENTAL VARIETIES

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

Four powdery mildew tolerant/resistant (PMR) experimentals from Harris Moran Seed Company were evaluated by comparing to a susceptible experimental (HMX 4694) and to a susceptible experimental treated with fungicides. The treated susceptible experimental was sprayed with Bravo Ultrex (1.8 lb/A) on 15, 23, 30 Aug; 5, 12 and 19 Sep, Nova 40W (4 oz /A) on 15 Aug and 12 Sep, and Benlate 50WP (8 oz/A) on 30 Aug. Applications were made using a tractor-mounted boom sprayer that delivered 100 gpa at 250 psi. Powdery mildew severity was assessed weekly. Orange fruit were harvested, weighed and handle condition evaluated on 9-10 Oct. Rotten and green fruit were counted.

Powdery mildew was significantly less severe on the PMR experimentals than on non-fungicide-treated HMX 4694 (14-26% vs 48% for upper leaf surfaces on 18 Sep). However, a higher level of disease control was expected. This may be due to race 2 occurring in this field. Chemical control was more effective than genetic control based on severity on upper leaf surfaces (4%). In sharp contrast, genetic control with HMX 5683 and HMX 6687 was more effective than chemical control based on severity on lower leaf surfaces (2-8% vs 25%). These differences in efficacy of chemical control on the two leaf surfaces are probably due to Bravo being deposited primarily on upper surfaces and the systemic fungicides being insufficiently effective on lower surfaces due to Benlate resistance and not enough Nova applied to compensate for Benlate resistance.

Chemical control was less effective on lower than upper leaf surfaces most likely because most of the Bravo was deposited on upper leaf surfaces of resistance to Benlate. There were no significant differences among the experimentals in powdery mildew severity, amount of defoliation (leaf death due primarily to powdery mildew), fruit weight, percent green fruit at harvest, percent rotten fruit, or percent fruit with solid handles; however, non-fungicide-treated HMX 4694 had the most defoliation, lowest fruit weight, and fewest fruit with handles that were not rotting. All experimentals produced fruit of high quality based on their excellent shape and dark orange color. Average fruit weight for the PMR experimentals was 16.4 lb. HMX 5680 and HMX 5683 will be available commercially in 1998.

This project was supported by the Friends of Long Island Horticulture.

CLEISTOTHECIUM FORMATION IN CUCURBIT POWDERY MILDEW UNDER NATURAL CONDITIONS

Investigator: N. Shishkoff
Location: Long Island Horticultural Research Laboratory

Since 1994, the appearance of cleistothecia of the cucurbit powdery mildew in test plots of squash or pumpkin has been noted and an attempt made to correlate it with climatic conditions. In 1997, three-week-old seedlings of yellow straightneck squash 'Seneca Prolific' were transplanted to duplicate 2 x 20 foot subplots (six plants per subplot) at 3 different planting dates (June 26, July 19, and Aug 15). Squash in the first planting were inoculated on July 22, the second on Aug 15 and the third on Sept 4 with each mating type of the fungus. When inoculated leaves were near senescence they were picked and examined under a dissecting scope at 40x for the presence of cleistothecia.

0.25, 0.5, 1.0, 2.5, and 5 ppm. After seedlings had dried, disks were cut from cotyledons; five disks per fungicide concentration were placed on water agar in divided petri plates. In each trial, duplicate sets of treated disks were inoculated with each mildew isolate, then plates were incubated for approximately 2 weeks at 24 C. For each fungicide concentration, growth of the mildew was considered to have occurred if sporulation was observed on 3 out of 5 disks. The percent leaf disk area colonized by sporulating mildew was recorded for each disk and averaged for each treatment.

Little variation in sensitivity to azoxystrobin was observed among 72 powdery mildew isolates from six states (NJ, NY, OK, CA, MD, TN). Mildew isolates did not respond to azoxystrobin with an "all or nothing" growth pattern; there was a succesive reduction in colony size with increasing concentrations of the fungicide. All isolates were able to grow at 0.25 ppm; 60% could grow at 0.5-1 ppm but no higher, 35% grew slightly (0.4-11% average percent leaf area) at 2.5 ppm, and 6% (4 isolates) grew very slightly (0.2-2.8%) at 5 ppm. There was no noticeable correlation between sensitivity and geographic location or sensitivity and race. An isolate with resistance to triadimefon and benomyl and was unable to grow on disks treated with >1 ppm azoxystrobin, indicating that resistance to triazoles and benzimidoles was independent of resistance to azoxystrobin.

IN VITRO TESTS TO DETERMINE SENSITIVITY OF CUCURBIT POWDERY MILDEWS FROM TREATED AND UNTREATED FIELD PLOTS TO THE FUNGICIDE AZOXYSTROBIN.

Investigator: N. Shishkoff and M. McGrath
Location: Long Island Horticultural Research Laboratory

In a field test of azoxystrobin (Quadris, Zeneca Ag Products), some powdery mildew colonies were observed on pumpkin ('Harvest Moon') that had been treated with the fungicide (see: **Evaluation of currently registered and new fungicides**). To determine if these colonies represented strains with reduced sensitivity to azoxystrobin, representative colonies were collected from treated plants and nontreated plants (5 colonies from each of 4 replicate plots, for a total of 20 colonies/trt). These isolates were used in a cotyledon disk assay as described above (***In vitro* tests to determine base-line sensitivity of cucurbit powdery mildew to the fungicide azoxystrobin**). No isolates from either treatment could grow at concentrations above 0.25 ppm, suggesting that any growth of mildew seen on sprayed plants was due to the occurrence of unsprayed portions of leaves.

POWDERY MILDEW OF CUCURBITS: DETERMINATION OF PATHOGEN RACE

Investigator: M. McGrath
Location: Long Island Horticultural Research Laboratory

Differential melon genotypes were grown near the powdery mildew experiments.

Hale's Best Jumbo, which is susceptible to all races of the powdery mildew fungus, and PMR-45, which is resistant to race 1, were severely infected by powdery mildew at maturity. In sharp contrast, no mildew was found on PMR-6, which is resistant to both race 1 and race 2 and susceptible to race 3. Therefore, race 2 but not race 3 of the powdery mildew fungus occurred on Long Island in 1997. Race 1, which was previously found to occur commonly in the eastern U.S., may have also been present in 1997. This is an important finding because most resistant varieties of pumpkin, squash, cucumber, and melon have resistance only to race 1.

Temperature and Rainfall Record - 1997; LIHRL, Riverhead, New York

July Day	High	Low	Precip	GDD at 50°F	Pan Evap
1	88	67	0	28	0.2
2	84	68	0.03	26	0.2
3	85	72	0	29	0.2
4	86	71	0	29	0.3
5	84	64	0	24	0.3
6	86	62	0	24	0.3
7	88	65	0	27	0.2
8	89	64	0	27	0.3
9	88	71	0	30	0.2
10	86	66	0.07	26	0.2
11	84	57	0	21	0.1
12	86	62	0	24	0.2
13	91	65	0	28	0.2
14	93	68	0	31	0.2
15	100	72	0	36	0.3
16	98	71	0	35	0.4
17	96	73	0	35	0.3
18	92	71	0	32	0.3
19	91	67	0.07	29	0.3
20	78	61	0	20	0.4
21	86	60	0	23	0.3
22	82	63	0.71	23	0.3
23	80	61	0	21	0.1
24	78	59	0.80	19	0.0
25	73	60	0.85	17	0.1
26	87	59	0	23	0.3
27	87	68	0	28	0.1
28	87	71	0	29	0.3
29	86	70	0	28	0.2
30	81	60	0	21	0.3
31	86	62	0	24	0.2
	87	**65**	**2.53**	**808**	**7.3**

August Day	High	Low	Precip	GDD at 50°F	Pan Evap
1	87	65	0	26	0.3
2	89	70	0	30	0.3
3	89	67	0	28	0.3
4	84	68	0.06	26	0.2
5	77	63	0.5	20	0.1
6	78	61	0.3	20	0.3
7	80	58	0	19	0.3
8	80	62	0	21	0.2
9	86	63	0.02	25	0.2
10	88	65	0	27	0.2
11	87	67	0	27	0.1
12	83	70	0	27	0.2
13	79	66	0.65	23	0
14	82	68	0	25	0.2
15	81	66	0	24	0.2
16	92	70	0	31	0.2
17	94	69	0	32	0.3
18	84	62	0.55	23	0
19	77	64	0.62	21	0.3
20	75	58	0	17	0.1
21	75	66	T	21	0.1
22	79	61	1.13	20	0
23	80	58	0	19	0.2
24	77	58	0	18	0.2
25	81	60	0	21	0.2
26	82	58	0	20	0.2
27	82	60	0	21	0.2
28	75	63	0.02	19	0
29	75	64	0.12	20	0
30	80	60	0	20	0
31	82	63	0	23	0
	82	**64**	**3.97**	**707**	**5.1**

September Day	High	Low	Precip	GDD at 50°F
1	82	66	0	24
2	84	67	0	26
3	80	62	0.02	21
4	70	55	0	13
5	74	52	0	13
6	82	54	0	19
7	82	58	0	20
8	82	65	0	24
9	72	63	0	18
10	72	59	0	16
11	74	65	0.47	20
12	81	67	0	24
13	81	60	0	21
14	78	65	0	22
15	78	63	0	21
16	80	58	0	19
17	79	61	0	20
18	77	67	0	22
19	82	58	0	20
20	85	64	0	25
21	80	53	0.08	17
22	68	44	0	6
23	68	53	T	22
24	63	50	0	7
25	71	40	0	6
26	71	52	0	12
27	71	54	0	13
28	68	51	0	10
29	72	60	0.63	16
30	74	60	0	17
	76	**58**	**1.20**	**513**

October Day	High	Low	Precip	GDD at 50°F
1	73	54	0	14
2	60	46	0	3
3	60	48	0	7
4	75	52	0	14
5	77	57	0	17
6	84	54	0	19
7	84	59	0	22
8	77	50	0	14
9	78	57	0	18
10	82	64	0	23
11	80	54	0	17
12	68	41	0	5
13	70	42	0	6
14	72	48	0	10
15	67	58	0	13
16	61	52	0.13	7
17	59	47	0	3
18	60	48	0	4
19	57	48	0	3
20	63	48	0	6
21	63	47	0	5
22	56	39	0	0
23	51	28	0	0
24	56	40	0	0
25	56	49	0.68	3
26	50	40	0	0
27	60	47	1	4
28	57	43	0	0
29	58	34	0	0
30	62	36	0	0
31	66	40	0	3
	66	**47**	**1.81**	**234**

November Day	High	Low	Precip	GDD at 50°F
1	59	58	1.00	9
2	62	56	0.42	9
3	67	48	0	8
4	66	47	0	7
5	58	39	0	0
6	56	37	0	0
7	55	48	0	2
8	53	47	1.16	0
9	50	47	0.43	0
10	54	46	0	0
11	51	41	0	0
12	49	34	0	0
13	45	33	0	0
14	40	34	0.78	0
15	38	33	0.91	0
16	40	32	0	0
17	43	31	0	0
18	46	28	0	0
19	48	25	0	0
20	47	29	0	0
21	59	29	0	0
22	53	39	0.84	0
23	43	39	0.17	0
24	41	28	0.13	0
25	41	28	0	0
26	58	37	0	0
27	51	40	0.13	0
28	47	31	0.02	0
29	48	40	0	0
30	47	28	0	0
	51	**38**	**5.99**	**33**

December Day	High	Low	Precip
1	48	29	0.18
2	43	32	0
3	49	32	0
4	47	34	0.17
5	46	38	0.03
6	40	31	0.05
7	40	29	0
8	45	39	0
9	44	25	0
10	42	30	0.19
11	37	31	0.40
12	41	31	0.15
13	41	31	0
14	43	30	0
15	44	25	0
16	53	28	0
17	51	31	0
18	48	35	0
19	53	28	0
20	49	34	0
21	43	29	0
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
	45	**31**	**1.17**

Temperature and Rainfall Record - 1997; LIHRL, Riverhead, New York

January

Day	High	Low	Precip
1	26	12	0
2	39	21	0.05
3	59	35	0
4	54	38	0
5	54	41	T
6	54	42	0
7	43	31	0
8	37	27	0
9	37	27	0
10	47	28	0.22
11	38	27	0.23
12	29	15	0
13	33	23	0
14	34	27	0
15	39	16	0
16	50	28	1.02
17	42	15	0
18	18	9	0
19	19	6	0
20	36	13	0
21	36	24	0
22	48	22	0
23	52	42	0.35
24	43	25	0
25	53	33	0.96
26	49	29	0
27	30	19	0
28	49	30	0.69
29	36	24	0
30	31	18	0
31	33	28	0
	40	**25**	**3.52**

February

Date	High	Low	Precip
1	49	32	0.12
2	44	32	0
3	46	35	0.02
4	41	31	0
5	51	34	0.98
6	43	37	0
7	41	29	0
8	36	28	T
9	35	25	0.15
10	35	26	0
11	40	29	0
12	40	25	0
13	36	25	0
14	50	26	0.86
15	48	38	0.06
16	42	29	0
17	33	23	0.11
18	49	24	0
19	64	41	0
20	59	37	0
21	57	34	0
22	62	45	0
23	55	32	0
24	44	32	0
25	43	18	0
26	51	24	0
27	60	43	0.07
28	63	40	0
	47	**31**	2.37

March

Day	High	Low	Precip	GDD at 50°F
1	50	33	0.03	
2	61	39	0.03	
3	59	32	0.15	
4	38	32	0.34	
5	45	34	0	
6	49	40	0.21	
7	41	33	0	
8	54	26	0	
9	48	23	0	
10	49	27	0.47	
11	51	30	0.02	
12	48	31	0	
13	42	24	0	
14	47	30	0.33	
15	50	36	0.56	
16	39	26	0	
17	41	21	0	
18	47	35	0	
19	44	35	0	
20	41	30	0.03	
21	49	30	0	
22	52	41	0.12	
23	42	26	0	
24	43	26	0	
25	49	27	0	
26	54	41	0.37	
27	59	32	0	
28	63	39	0	1
29	59	44	0.04	2
30	62	47	0.19	5
31	60	37	2.05	0
	50	**32**	**4.94**	7

April

Day	High	Low	Precip	GDD at 50°F
1	45	31	0.34	0
2	53	38	0	0
3	59	38	0	0
4	62	48	0	5
5	59	40	0	0
6	58	44	0	1
7	74	56	0.02	15
8	70	39	0	5
9	57	31	T	0
10	49	29	0	0
11	52	34	0	0
12	54	38	0.12	0
13	67	47	0.73	7
14	65	41	0	3
15	57	36	0	0
16	64	33	0	0
17	60	44	0.04	2
18	52	38	0.8	0
19	48	37	0.21	0
20	57	39	0	0
21	55	42	0	0
22	63	37	0	0
23	62	38	0	0
24	58	41	0.19	0
25	61	44	0.02	3
26	65	45	0	5
27	66	42	0	4
28	59	46	0.96	3
29	67	46	0	7
30	71	42	0	7
	60	**40**	**3.43**	65

May

Day	High	Low	Precip	GDD at 50°F	Pan Evap
1	67	46	0	7	
2	65	47	0	6	
3	65	48	0.22	7	
4	61	49	0	5	
5	65	38	0	2	
6	63	49	0.15	6	0.0
7	57	44	0	1	0.2
8	62	44	0	3	0.5
9	64	46	0.25	5	0.3
10	61	49	0.11	5	0.0
11	66	47	0	7	0.4
12	69	47	0	8	0.2
13	67	49	0.03	8	0.1
14	71	45	0.02	8	0.3
15	72	57	0.04	15	0.0
16	71	51	0.07	11	0.2
17	68	45	0	7	0.4
18	67	48	0	8	0.3
19	78	51	0.22	15	0.0
20	78	53	0.17	16	0.1
21	68	48	0	8	0.2
22	61	49	0	5	0.4
23	68	51	0	10	0.2
24	74	48	0	11	0.3
25	74	55	0.91	15	0.0
26	72	55	0.16	14	0.0
27	71	48	0	10	0.1
28	75	40	0	8	0.2
29	74	46	0	10	0.2
30	70	49	T	10	0.2
31	73	53	0.01	13	0.2
	68	**48**	**2.52**	256	5.0

June

Day	High	Low	Precip	GDD at 50°F	Pan Evap
1	76	60	T	18	0.1
2	69	55	0.70	12	0.0
3	62	49	0.16	6	0.0
4	66	49	0	8	0.3
5	70	49	0	10	0.2
6	69	48	0	9	0.2
7	68	49	0	9	0.1
8	72	51	0	12	0.1
9	73	45	0	9	0.3
10	89	50	0	20	0.3
11	90	63	0	27	0.3
12	90	64	0	27	0.3
13	84	63	0.20	24	0.2
14	80	63	0	22	0.3
15	78	55	0	17	0.3
16	75	48	0	12	0.2
17	78	54	0	16	0.2
18	74	61	0.21	18	0.1
19	84	62	0.03	23	0.1
20	86	64	0	25	0.3
21	92	68	0	30	0.2
22	95	68	0.45	32	0.2
23	85	62	0	24	0.1
24	86	65	0	26	0.2
25	94	66	0	30	0.3
26	92	73	0	33	0.4
27	81	64	0.14	23	0.0
28	87	61	0	24	0.4
29	92	61	0	27	0.4
30	90	64	0	27	0.2
	81	**58**	**1.89**	591	6.3

May. Because of the excellent cooperation from the participating growers [they had to adjust their spray schedule and spray the test areas differently], predators were recovered from the sites. This was a major accomplishment as mite predators are virtually non-existent in local vineyards. Other results from their work indicate that certain spray materials such as mancozeb and sulfur are injurious to predators. It is conceivable then that spray schedules could be altered or new materials substituted so that predator populations could be maintained. Work in 1998 will address this issue.

vineyards. The wines will also be poured for critical evaluation during the presentation of data to the industry in early 1998.

Over thirty wines were made during the fall of 1997, 24 at LIHRL and another ten by local winemakers (from LIHRL fruit). These wines will follow the same protocol as the '96 wines. After discussions with local and consulting winemakers, several tests will be done on these wines prior to bottling in order to provide winemakers a more complete picture.

CONTROL OF CROWN GALL IN LONG ISLAND VINEYARDS

Investigators: Dr. Tom Burr, NYSAES, and A. Wise
Location: Long Island Horticultural Research Laboratory

Crown gall, caused by the bacteria *Agrobacterium vitis*, is a disease of grapevines known worldwide. The bacteria survives systemically in vines; the majority of material planted in vineyards [both on and off Long Island] presumed to be infected. Under certain conditions of stress, such as winter injury, the bacteria "switches on", causing the vines to overproduce certain growth hormones. This in turn leads to the formation of massive galls on woody portions of the vine, eventually choking the vine. Particularly in lower areas of the vineyard where winter injury is more common, crown gall leads to a loss of vines, hence a loss of production.

Several treatments have shown promise for control of crown gall. Under the direction of Dr. Tom Burr, the efficacy of three treatments, hot water baths and two biocontrol agents, are being tested. Hot water treatment of dormant cuttings have been shown to knock the bacteria to below detectable levels. The idea is to eradicate (as much as possible) the crown gall bacteria with hot water, then inoculate the vine with the biocontrol. Ideally, the biocontrol agents will occupy the same ecological niche as the disease-causing bacteria, thereby preventing any reinfection by the crown gall bacteria. The efficacy of these treatments is evaluated in conjunction with field performance of treated vines. The first series of treated vines was planted at LIHRL in spring 1995. Thus far, all of the vines are healthy. Crop from these vines was used in winemaking experiments. An additional two rows were planted in 1997.

INVESTIGATING THE USE OF PREDATORS FOR CONTROL OF EUROPEAN RED MITE

Investigators: Drs. Jan Nyrop and Greg English-Loeb, NYSAES, and A. Wise
Location: local vineyards

European red mite is a pest of grapevines as well as tree fruit on Long Island. The tiny mite damages vines by sucking out the contents of individual cells. Feeding by even low numbers of mites imparts a bronze color to the leaves. It is thought, although research results are not conclusive on this point, that the leaves are then photosynthetically impaired. This of course has implications for ripening and general vine health.

Researchers in Europe have developed a system whereby they encourage the development and maintaining of mite predators. These predators in many cases are able to effect biological control. The strategy relies on a number of variables, including the deletion of certain spray materials that are harmful to the predators as well as release of either laboratory-reared predators and/or predators collected from another site.

Drs. Nyrop and English-Loeb are investigating the use of mite predators in both apples and grapes in sites across the northeast. Mite predators were collected from upstate apple orchards and vineyards and were released in two local vineyards in late

GRAPES

EVALUATION OF CHARDONNAY, MERLOT AND CABERNET SAUVIGNON WINEGRAPE CLONES; OBSERVATIONS ON WINEGRAPE VARIETIES

Investigator: A. Wise
Location: Long Island Horticultural Research Laboratory

A clonal trial was initiated at the Long Island Horticultural Research Lab in the spring of 1992. Clones of three commercially important varieties, Chardonnay, Merlot, and Cabernet Sauvignon have been grafted onto two rootstocks, C3309 and MG 101-14, and grown as own-rooted vines. More than 30 miscellaneous varieties have been planted in the border rows of this trial, enabling an informal evaluation of new grape varieties as well as clones of varieties such as Pinot Noir.

Approximately 4 tons of fruit was harvested in September and October 1997. Yields were very low in 1997 due to a season long drought. This affected the incorporation of nitrogen into the root zone and necessitated substantial fruit thinning due to vine stress. For all bearing vines, the following data was taken: crop weight, cluster number, berry number/cluster, and fruit quality assessments (°Brix, titratible acidity, and pH). Due to unprecedented dry weather during the fall, fruit quality was excellent. Shoot number and pruning weights will be taken this winter.

After three years of harvest several trends are emerging. The Chardonnay clones appear to be the most diverse. The subtle differences seen thus far in the Merlot clones may be true differences or may be due to other factors such as growing season. Cabernet Sauvignon clones exhibit differences in the vineyard although the presence of a virus in two of the clones has muddied results. A number of "new" varieties such as Syrah, Malbec and Dolcetto have shown great promise.

The vine and wine results are being tallied and will be presented to growers in early 1998 at a combination tasting/data presentation. A comprehensive booklet distributed to each participant last year will be presented with updated information. The presentation of data along with comments and observations appeared to be very useful to growers and facilitated some very interesting discussions.

SMALL LOT WINEMAKING FROM VINIFERA WINEGRAPE CLONES AND NEW VARIETIES OF INTEREST

Investigator: A. Wise
Location: Long Island Horticultural Research Laboratory

Evaluation both in the vineyard and in the winery is essential. For example, there are some grape clones or varieties which perform well in the vineyard yet make uninteresting wines. The goal of winemaking in this trial is to allow growers to preview unfamiliar clones and varieties. While differences exist between experimental and commercial-scale winemaking, these wines provide a critical glimpse into wine potential. By understanding potential wine style, growers may more carefully select future plant material for their own vineyards.

Twenty-six wines were made during the fall of 1996. These were bottled in June, 1997. These wines have been poured/donated to the following: May '96 winemakers meeting, Aug. '96 LIWC Barrel Tasting, Nov. '96 Friends of Riverhead Library, Nov. 1 grape research fund raiser, and various Extension events. A number of small tastings have been held for significant visitors and for several people interested in planting

2LC at 0.187 and 0.313 lbs/a a.i. with and without X-77 at 0.25%. Early injury was seen if plants treated with Basagran with and without surfactant at the 2nd trifoliate timing at both high and low rates and with Reflex + X-77 at high and low rates at the last three timings. No early injury was seen for Reflex without surfactant. By season's end, all treatments had recovered so that no significant difference in fresh weight of beans harvested was found. Lowest weed counts were achieved for fourth timing treatments of Basagran with surfactant and Reflex high rate with surfactant.

In the second study, a stale seed bed was started on 5/14/97 (i.e. beds were prepared then left fallow to allow the first flush of weed seeds to germinate). Two varieties of beans, 'Strike' and 'Volcano', were planted into the stale seed bed one week and two weeks after it was started. At the young unifoliate stage (approximately three weeks after planting), the beans were treated, both predawn and postdawn, with Reflex 2LC at 0.313 + X-77@ 0.25%; and with Basagran 4WS at 1.0 lbs/a a.i. + COC @ 1%. Weedy and handweeded controls were also included.

Native populations of weeds included lambsquarters, smartweed, dandelion, groundsel, wild radish, and marsh yellow cress. Weed count data revealed that all treatments provided acceptable weed control.

A harvest performed on 7/21/97 revealed that 'Strike' beans treated post dawn in the two week old stale seed bed yielded significantly lower bean weights than untreated plants or plants treated predawn. These plants, and other high rate Basagran post dawn treated plants, appeared injured during visual observations earlier in the season. The other injured plants recovered before harvest so that their yields were not significantly lower than the handweeded control plants.

In the third test, the same two bean varieties were planted into a freshly disked bed on 6/5/97. At the young unifoliate stage (approximately two weeks after planting), treatments of Reflex at 0.313 lbs/a a.i. + X-77 @ 0.25% were applied predawn, post dawn, at noon, and at dusk.

Control of the native weed population was acceptable for all treatments.

Slight but significant injury was observed one month after treatment for the noon applied Reflex. These plants recovered by harvest time as no significant differences in yield were observed.

At this point in our studies, there is still no conclusive evidience of the efficacy of reduced rates of Reflex on common ragweed. Our studies next year will focus on this question.

This project was supported by Friendsof Long Island Horticulture.

Long Island Horticultural Research Laboratory
'87-'97 High and Low Temperatures and Precipitation; 10 year Average.

Precipitation

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	10-yr avg.
January	5.92	3.48	1.67	4.69	4.03	2.27	2.05	5.71	2.63	5.25	3.52	3.75
February	1.00	5.13	3.12	2.48	1.44	1.95	3.79	3.65	3.82	3.30	2.24	2.90
March	5.05	4.73	4.06	1.53	4.31	2.70	7.40	6.55	1.51	3.38	4.94	4.20
April	6.07	2.82	5.11	5.07	5.00	1.97	4.02	2.23	2.41	6.43	3.43	4.05
May	1.92	2.91	7.38	6.60	3.16	1.95	0.65	2.75	2.95	3.62	2.52	3.31
June	0.92	1.60	6.14	2.89	1.32	6.51	2.42	0.19	2.52	2.94	1.89	2.67
July	1.68	4.21	6.32	4.59	2.07	3.45	2.36	0.70	1.52	4.78	2.53	3.11
August	4.76	1.04	8.88	4.23	9.36	6.92	1.24	7.26	0.70	2.80	3.97	4.65
September	4.34	3.09	5.10	2.96	4.86	4.81	7.61	3.76	4.43	4.74	1.20	4.26
October	2.77	4.03	7.16	7.26	2.27	1.36	4.53	1.05	6.35	9.12	1.81	4.34
November	3.74	9.42	5.48	1.90	2.03	5.48	4.03	4.89	5.25	3.13	5.99	4.67
December	3.03	2.07	1.03	5.80	4.26	5.72	5.48	3.75	3.38	7.79		4.23

Maximum and Minimum Temperatures

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	10-yr avg.
Jan (max)	38	37	40	46	41	42	42	35	45	39	40	40
(min)	27	22	28	31	26	26	27	17	29	25	25	26
Feb (max)	38	41	40	47	46	43	38	37	39	40	47	41
(min)	26	27	26	29	29	28	21	19	21	25	31	26
Mar (max)	52	50	48	53	51	46	45	48	52	46	50	49
(min)	33	32	31	33	36	30	30	29	32	27	32	31
Apr (max)	60	57	59	59	63	57	59	63	60	59	60	60
(min)	42	40	39	41	44	38	41	40	37	40	40	40
May (max)	72	70	72	68	76	70	74	70	69	71	68	71
(min)	49	48	50	49	54	48	50	47	47	48	48	49
Jun (max)	82	80	81	79	83	78	80	83	80	80	81	81
(min)	61	60	62	60	61	58	58	60	57	60	58	60
Jul (max)	86	87	83	83	85	81	87	88	86	80	87	85
(min)	67	67	65	66	66	63	65	67	65	63	65	65
Aug (max)	81	86	82	83	85	80	84	81	86	82	82	83
(min)	62	68	66	67	67	62	63	60	62	63	64	64
Sep (max)	74	75	76	76	75	74	76	76	76	75	76	75
(min)	58	57	60	57	58	59	57	56	56	58	58	58
Oct (max)	63	60	66	68	66	62	64	65	70	65	66	65
(min)	45	43	47	54	49	45	44	45	49	45	48	47
Nov (max)	57	56	53	57	54	53	56	60	52	49	51	54
(min)	39	39	37	40	41	39	36	40	36	36	38	38
Dec (max)	45	44	33	51	48	45	43	48	40	47		44
(min)	32	28	20	34	32	30	28	31	26	35		30

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

Please read instructions on reverse side before filliing out this form. Reports that are not filed in accordance with these insructions will be rejected..

Certification ID Number
C1670967

Applicator Margaret T. McGrath

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No.

Name of Registered Pesticide Business
Cornell University, L.I. Horticultural Research Laboratory

Report Year
1997

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
264-516	Aliette 80WDG	45.4	GM	9/25/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	45.4	GM	10/1/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	45.4	GM	10/7/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	45.4	GM	10/13/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	90.8	GM	10/20/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	90.8	GM	10/30/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	90.8	GM	11/5/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	45.4	GM	5/21/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	45.4	GM	5/28/97	47	3059 Sound Avenue	Riverhead	11901
264-516	Aliette 80WDG	45.4	GM	6/4/97	47	3059 Sound Avenue	Riverhead	11901
352-354	Benlate 50WP	178.6	GM	8/30/97	47	3059 Sound Avenue	Riverhead	11901
50534-201	Bravo Ultrex	381.7	GM	8/15/97	47	3059 Sound Avenue	Riverhead	11901
50534-201	Bravo Ultrex	200.9	GM	8/23/97	47	3059 Sound Avenue	Riverhead	11901
50534-201	Bravo Ultrex	381.7	GM	8/30/97	47	3059 Sound Avenue	Riverhead	11901
50534-201	Bravo Ultrex	200.9	GM	9/5/97	47	3059 Sound Avenue	Riverhead	11901
50534-201	Bravo Ultrex	241.1	GM	9/13/97	47	3059 Sound Avenue	Riverhead	11901
50534-201	Bravo Ultrex	200.9	GM	9/19/97	47	3059 Sound Avenue	Riverhead	11901
55146-64	Champ 2F	105.00	ML	8/15/97	47	3059 Sound Avenue	Riverhead	11901

'ounty: Use County Code on Back

**Units: LB=Pounds, OZ=Ounces, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

This report is due to the Department NO LATER THAN February 1 of the year following the calendar year for which the report is being submitted.

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number: **C1670967**

Applicator: Margaret T. McGrath

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No.:

Name of Registered Pesticide Business: **Cornell University, L.I. Horticultural Research Laboratory**

Report Year: **1997**

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
55146-64	Champ 2F	105.00	ML	8/23/97	47	3059 Sound Avenue	Riverhead	11901
55146-64	Champ 2F	105.00	ML	8/30/97	47	3059 Sound Avenue	Riverhead	11901
55146-64	Champ 2F	105.00	ML	9/5/97	47	3059 Sound Avenue	Riverhead	11901
55146-64	Champ 2F	105.00	ML	9/13/97	47	3059 Sound Avenue	Riverhead	11901
55146-64	Champ 2F	105.00	ML	9/19/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	112.00	GM	7/8/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	112.00	GM	7/14/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	121.30	GM	7/21/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	279.80	GM	7/29/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	311.40	GM	8/5/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	222.40	GM	8/14/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	311.40	GM	8/20/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	249.10	GM	8/30/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	249.10	GM	9/5/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	249.10	GM	9/13/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	71.20	GM	9/17/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide 2000	249.10	GM	9/19/97	47	3059 Sound Avenue	Riverhead	11901
1812-358	Kocide DF	373.50	GM	9/26/97	47	3059 Sound Avenue	Riverhead	11901

'ounty: Use County Code on Back

**Units: LB=Pounds, OZ=Ounces, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

This report is due to the Department NO LATER THAN February 1 of the year following the calendar year for which the report is being submitted.

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

Please read instructions on reverse side before filliing out this form. Reports that are not filed in accordance with these insructions will be rejected..

Certification ID Number: **C1670967**

Applicator Margaret T. McGrath

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No.

Name of Registered Pesticide Business
Cornell University, L.I. Horticultural Research Laboratory

Report Year **1997**

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
1812-338	Kocide LF 2.4F	64.00	GM	9/25/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	9/25/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	64.00	ML	10/1/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	10/1/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	64.00	ML	10/7/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	10/7/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	64.00	ML	10/13/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	10/13/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	32.00	ML	10/20/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	10/20/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	32.00	ML	10/30/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	10/30/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	32.00	ML	11/5/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	11/5/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	64.00	ML	5/21/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	5/21/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	64.00	ML	5/28/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	5/28/97	47	3059 Sound Avenue	Riverhead	11901

'ounty: Use County Code on Back

**Units: LB=Pounds, OZ=Ounces, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

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New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

Please read instructions on reverse side before filliing out this form. Reports that are not filed in accordance with these insructions will be rejected..

Certification ID Number	Applicator Margaret T. McGrath			Applicator Business Registration No.				Report Year
C1670967				Name of Registered Pesticide Business				**1997**
Applicator Address (Street, City, Zip Code)				**Cornell University, L.I. Horticultural Research Laboratory**				
3059 Sound Ave., Riverhead, NY 11901				LOCATION OF APPLICATION (SEE NOTE ON BACK)				
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
1812-338	Kocide LF 2.4F	64.00	ML	6/4/97	47	3059 Sound Avenue	Riverhead	11901
1812-338	Kocide LF 2.4F	12.60	ML	6/4/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	84.00	GM	7/8/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	84.00	GM	8/14/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	91.00	GM	7/21/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	209.00	GM	7/29/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	200.20	GM	8/5/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	133.40	GM	8/14/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	200.10	GM	8/20/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	133.40	GM	8/30/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	186.80	GM	9/5/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	186.80	GM	9/13/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	53.40	GM	9/17/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	133.40	GM	9/19/97	47	3059 Sound Avenue	Riverhead	11901
4581-371	Maneb 75DF	133.40	GM	9/26/97	47	3059 Sound Avenue	Riverhead	11901

*County: Use County Code on Back

**Units: LB=Pounds, OZ=Ounces, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

This report is due to the Department NO LATER THAN February 1 of the year following the calendar year for which the report is being submitted.

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

Please read instructions on reverse side before filliing out this form. Reports that are not filed in accordance with these insructions will be rejected..

PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1-661564	Daniel Gilrein	06695	

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business
3059 Sound Avenue, Riverhead, N.Y.11901	Cornell University

					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
59639-26	Orthene TTO	1.6	g	4/3/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	65	g	4/23/97	47	3059 Sound Ave	Riverhead	11901
618-96	Avid 0.15 EC	5	ml	5/5/97	47	3059 Sound Ave	Riverhead	11901
862-28	Ultrafine oil	80	ml	5/5/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene TTO	6.4	g	5/5/97	47	3059 Sound Ave	Riverhead	11901
62719-220	Lorsban 4E	191.5	ml	6/11/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	0.27	g	6/12/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.72	g	6/12/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.36	g	6/12/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.72	g	6/12/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.72	g	6/19/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.36	g	6/19/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.72	g	6/19/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.72	g	6/26/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.36	g	6/26/97	47	3059 Sound Ave	Riverhead	11901
10182-379-400	Topcide 10 WP	0.72	g	6/26/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	65	g	6/26/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	0.3	g	7/15/97	47	3059 Sound Ave	Riverhead	11901
400-469	Adept 25 W	0.149	g	6/27/97	47	3059 Sound Ave	Riverhead	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1-661564	Daniel Gilrein	06695	

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business	
3059 Sound Avenue, Riverhead, N.Y.11901	Cornell University	1997

					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
100-750	Precision	0.599	g	6/27/97	47	3059 Sound Ave	Riverhead	11901
400-469	Adept 25 W	0.149	g	7/23/97	47	3059 Sound Ave	Riverhead	11901
100-750	Precision	0.599	g	7/23/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	8/4/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	8/4/97	47	3059 Sound Ave	Riverhead	11901
400-469	Adept 25 W	0.149	g	8/23/97	47	3059 Sound Ave	Riverhead	11901
100-750	Precision	0.599	g	8/23/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	8/11/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	8/11/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	8/18/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	8/18/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	8/25/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	8/25/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	9/1/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	9/1/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	9/8/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	9/8/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	0.463	ml	9/15/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene 75S	4.31	g	9/15/97	47	3059 Sound Ave	Riverhead	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1-661564	Daniel Gilrein	06695	

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business	
3059 Sound Avenue, Riverhead, N.Y.11901	Cornell University	1997

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
10182-96	Warrior	14.18	ml	8/6/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	10.64	ml	8/6/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/6/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	14.18	ml	8/9/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	10.64	ml	8/9/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/9/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	14.18	ml	8/12/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	10.64	ml	8/12/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/12/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	14.18	ml	8/15/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	10.64	ml	8/15/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/15/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	14.18	ml	8/19/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	10.64	ml	8/19/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/19/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	14.18	ml	8/23/97	47	3059 Sound Ave	Riverhead	11901
3125-351	Baythroid 2E	10.64	ml	8/23/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/23/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	14.18	ml	8/28/97	47	3059 Sound Ave	Riverhead	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1-661564	Daniel Gilrein	06695	

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business	
3059 Sound Avenue, Riverhead, N.Y.11901	Cornell University	1997

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
3125-351	Baythroid 2E	10.64	ml	8/28/97	47	3059 Sound Ave	Riverhead	11901
264-379	Larvin	133	ml	8/28/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	0.98	ml	8/12/97	47	3059 Sound Ave	Riverhead	11901
3125-280	Monitor	9.83	ml	8/12/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	0.98	ml	8/18/97	47	3059 Sound Ave	Riverhead	11901
3125-280	Monitor	9.83	ml	8/18/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	0.98	ml	8/25/97	47	3059 Sound Ave	Riverhead	11901
275-105	Dipel DF	4.72	g	8/25/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	0.98	ml	9/1/97	47	3059 Sound Ave	Riverhead	11901
275-105	Dipel DF	4.72	g	9/1/97	47	3059 Sound Ave	Riverhead	11901
10182-96	Warrior	0.98	ml	9/8/97	47	3059 Sound Ave	Riverhead	11901
275-105	Dipel DF	4.72	g	9/8/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	65	g	9/8/97	47	3059 Sound Ave	Riverhead	11901
618-96	Avid 0.15 EC	3.75	ml	9/8/97	47	3059 Sound Ave	Riverhead	11901
862-28	Ultrafine oil	60	ml	9/8/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene TTO	5.4	g	9/8/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	1.032	g	9/19/97	47	3059 Sound Ave	Riverhead	11901
3125-492-59807	Marathon 60 WP	0.782	g	10/13/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene TTO	4.19	g	9/26/97	47	3059 Sound Ave	Riverhead	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1-661564	Daniel Gilrein	06695	1997

Applicator Address (Street, City, Zip Code)
3059 Sound Avenue, Riverhead, N.Y.11901

Name of Registered Pesticide Business
Cornell University

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
618-98	Agrimek 0.15EC	5.76	ml	8/14/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.19	ml	12/15/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.374	ml	12/15/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.749	ml	12/15/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene TTO	2.39	g	12/15/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.19	ml	12/22/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.374	ml	12/22/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.749	ml	12/22/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene TTO	2.39	g	12/22/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.19	ml	12/29/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.374	ml	12/29/97	47	3059 Sound Ave	Riverhead	11901
10182-417-400	Topcide O/S	0.749	ml	12/29/97	47	3059 Sound Ave	Riverhead	11901
59639-26	Orthene TTO	2.39	g	12/29/97	47	3059 Sound Ave	Riverhead	11901
275-85	Xentari DF	4.72	g	10/2/97	47	3059 Sound Ave	Riverhead	11901
275-85	Xentari DF	4.72	g	10/2/97	47	3059 Sound Ave	Riverhead	11901
275-85	Xentari DF	4.72	g	10/6/97	47	3059 Sound Ave	Riverhead	11901
275-85	Xentari DF	4.72	g	10/10/97	47	3059 Sound Ave	Riverhead	11901
275-85	Xentari DF	4.72	g	10/10/97	47	3059 Sound Ave	Riverhead	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1800498	Lucille Siracusano	C6695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Avenue, Riverhead, N.Y.11901

Name of Registered Pesticide Business: Cornell University

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
none								

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name :	Applicator Business Registration No.	Report Year
C1664653	Andrew Senesac	#06695	1997

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business
3059 Sound Ave., Riverhead, NY 11901	Long Island Horticultural Research Laboratory

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Registraton No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
707-174	Goal 1.6EC	600	ml	3/24/97	47	3059 Sound Avenue	Riverhead	11901
241-360	Pendulum 3.3EC	600	ml	3/24/97	48	3059 Sound Avenue	Riverhead	11901
279-3105	Talstar F	75	ml	4/11/97	49	3059 Sound Avenue	Riverhead	11901
34704-01	Ronstar&Devrinol	6	lbs	4/15/97	50	3059 Sound Avenue	Riverhead	11901
524-475	Round-Up Pro	600	ml	6/5/97	51	3059 Sound Avenue	Riverhead	11901
62719-113	Surflan 4AS	23	ml	5/9/97	52	3059 Sound Avenue	Riverhead	11901
53219-7	Scythe	454	ml	5/25/97	53	3059 Sound Avenue	Riverhead	11901
62719-73	Stinger 3EC	536	ml	9/6/97	54	3059 Sound Avenue	Riverhead	11901
62719-40	Turflon II Amine	2710	ml	9/6/97	55	3059 Sound Avenue	Riverhead	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name :	Applicator Business Registration No.	Report Year
C1664542	Irene Tsontakis-Bradley	#06695	1997

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business
3059 Sound Ave., Riverhead, NY 11901	Long Island Horticultural Research Laboratory

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Registraton No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
none	none							

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259
Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name : **Margery Daughtrey**			Applicator Business Registration No. 06695				Report Year
C1609512				Name of Registered Pesticide Business				**1997**
Applicator Address (Street, City, Zip Code)				**Cornell University, L.I Horticultural Res. Lab**				
3059 Sound Ave., Riverhead, NY 11901								
				LOCATION OF APPLICATION (SEE NOTE ON BACK)				
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code

ounty: Use County Code on Back

**Units: LB=Pounds, OZ=Ounces, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259
Commercial Applicators Annual Report—Pesticides Used

Please read instructions on reverse side before filliing out this form. Reports that are not filed in accordance with these insructions will be rejected..

Certification ID Number: **C1664545**

Applicator Name : **Maria Macksel**

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No. 06695

Name of Registered Pesticide Business
Cornell University, L.I Horticultural Res. Lab

Report Year **1997**

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
3125-318	Strike	0.13	GM	4/3/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.13	GM	4/29/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.13	GM	5/27/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.03	ML	4/7/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.03	ML	5/13/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.1	ML	4/16/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.1	ML	5/8/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	2.1	GM	7/31/97	47	3059 Sound Ave	Riverhead, NY	11901
264-482	Chipco 26019	3.36	GM	5/7/97	47	3059 Sound Ave	Riverhead, NY	11901
264-482	Chipco 26019	3.36	GM	5/14/97	47	3059 Sound Ave	Riverhead, NY	11901
264-482	Chipco 26019	3.36	GM	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27 27	0.6	ML	5/7/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27 27	0.6	ML	5/14/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27 27	0.6	ML	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	6/27/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	7/10/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	7/18/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259
Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number
C1664545

Applicator Name : **Maria Macksel**

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No. 06695

Name of Registered Pesticide Business
Cornell University, L.I Horticultural Res. Lab

Report Year
1997

					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
400-433	Terraguard	0.14	GM	7/25/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	6/27/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	7/10/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	7/18/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.75	ML	7/25/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	6/27/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	7/10/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	7/18/97	47	3059 Sound Ave	Riverhead, NY	11901
3125-318	Strike	0.14	GM	7/25/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259
Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number
C1664545

Applicator Name : **Maria Macksel**

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No. 06695

Name of Registered Pesticide Business
Cornell University, L.I Horticultural Res. Lab

Report Year
1997

Col 1	Col 2	Col 3	Col 4	Col 5	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
862-28	Sunspray Ultrafine	7	ML	6/27/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	7/10/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	7/18/97	47	3059 Sound Ave	Riverhead, NY	11901
862-28	Sunspray Ultrafine	7	ML	7/25/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	6/27/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	7/10/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	7/18/97	47	3059 Sound Ave	Riverhead, NY	11901
707-180	Dithane T/O	0.84	GM	7/25/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	5/21/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	6/27/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	7/10/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	7/18/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.56	GM	7/25/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	2.05	ML	5/8/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259
Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name : **Maria Macksel**			Applicator Business Registration No. 06695				Report Year
C1664545				Name of Registered Pesticide Business				**1997**
Applicator Address (Street, City, Zip Code)				**Cornell University, L.I Horticultural Res. Lab**				
3059 Sound Ave., Riverhead, NY 11901								
				LOCATION OF APPLICATION (SEE NOTE ON BACK)				
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
49538-2	Phyton 27	1.58	ML	5/15/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	5/15/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.6	ML	5/29/97	47	3059 Sound Ave	Riverhead, NY	11901
49538-2	Phyton 27	0.3	ML	6/5/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	6/12/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	6/26/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	7/9/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	7/28/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	8/7/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	8/8/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	8/22/97	47	3059 Sound Ave	Riverhead, NY	11901
100-641	Banner Maxx	1.2	ML	9/9/97	47	3059 Sound Ave	Riverhead, NY	11901
67690-1	Pipron	0.9	ML	8/5/97	47	3059 Sound Ave	Riverhead, NY	11901
67690-1	Pipron	0.9	ML	8/13/97	47	3059 Sound Ave	Riverhead, NY	11901
67690-1	Pipron	0.9	ML	8/19/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	2.24	GM	8/5/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	2.24	GM	8/13/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	2.24	GM	8/19/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	7/30/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	8/5/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.14	GM	8/13/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259
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C1664545

Applicator Name : **Maria Macksel**

Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No. 06695

Name of Registered Pesticide Business
Cornell University, L.I Horticultural Res. Lab

Report Year
1997

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
400-433	Terraguard	0.14	GM	8/19/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	15.5	GM	8/12/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	15.5	GM	9/15/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.94	GM	8/7/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.94	GM	9/3/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	1.98	GM	8/7/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	1.98	GM	9/3/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.98	GM	8/12/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.98	GM	9/9/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	1.98	GM	8/12/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	1.98	GM	9/9/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	1.12	GM	10/14/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	1.12	GM	10/29/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.56	GM	11/12/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.56	GM	11/26/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.56	GM	12/10/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	1.68	GM	8/21/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.36	GM	9/4/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	1.68	GM	9/1897	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.36	GM	10/1/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	1.68	GM	10/15/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
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Commercial Applicators Annual Report—Pesticides Used

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Applicator Address (Street, City, Zip Code)
3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No. 06695

Name of Registered Pesticide Business
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Report Year
1997

LOCATION OF APPLICATION (SEE NOTE ON BACK)

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
400-433	Terraguard	0.36	GM	10/28/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	1.68	GM	11/13/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.36	GM	12/3/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.96	GM	8/21/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.36	GM	9/4/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.6	GM	9/11/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.36	GM	9/18/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.96	GM	10/1/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.36	GM	10/15/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.6	GM	10/22/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.36	GM	10/28/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	3.96	GM	11/13/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	0.36	GM	12/3/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	12	GM	9/3/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	8	GM	10/1/97	47	3059 Sound Ave	Riverhead, NY	11901
58185-10	Banrot	8	GM	10/28/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	1.44	ML	9/3/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.48	ML	10/1/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.48	ML	10/14/97	47	3059 Sound Ave	Riverhead, NY	11901
100-796	Subdue Maxx	0.96	ML	10/14/97	47	3059 Sound Ave	Riverhead, NY	11901
264-515	Aliette	8.8	ML	9/3/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
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3059 Sound Ave., Riverhead, NY 11901

Applicator Business Registration No. 06695

Name of Registered Pesticide Business
Cornell University, L.I Horticultural Res. Lab

Report Year **1997**

Col 1	Col 2	Col 3	Col 4	Col 5	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
264-515	Aliette	8.8	ML	10/1/97	47	3059 Sound Ave	Riverhead, NY	11901
264-515	Aliette	8.8	ML	10/28/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.9	ML	10/16/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.45	ML	10/23/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.9	ML	10/29/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.45	ML	11/6/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.9	ML	11/12/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.45	ML	11/20/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.9	ML	11/26/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.45	ML	12/3/97	47	3059 Sound Ave	Riverhead, NY	11901
67970-1	Pipron	0.9	ML	12/10/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	1.68	GM	10/16/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	1.68	GM	10/29/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	1.68	GM	11/12/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	1.68	GM	11/26/97	47	3059 Sound Ave	Riverhead, NY	11901
1001-63	Cleary's 3336	1.68	GM	12/10/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.56	GM	11/6/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.28	GM	11/12/97	47	3059 Sound Ave	Riverhead, NY	11901

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
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Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name : **Maria Macksel**			Applicator Business Registration No. 06695				Report Year
C1664545				Name of Registered Pesticide Business				**1997**
Applicator Address (Street, City, Zip Code)				**Cornell University, L.I Horticultural Res. Lab**				
3059 Sound Ave., Riverhead, NY 11901								
				LOCATION OF APPLICATION (SEE NOTE ON BACK)				
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9
EPA Reg. No.	Product Name	Quantity Used	Units**	Date of Appl.	County Code*	Address	Municipality (City Village, etc.)	Zip Code
400-433	Terraguard	0.56	GM	11/19/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.28	GM	11/26/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.56	GM	12/3/97	47	3059 Sound Ave	Riverhead, NY	11901
400-433	Terraguard	0.28	GM	12/10/97	47	3059 Sound Ave	Riverhead, NY	11901

ounty: Use County Code on Back

**Units: LB=Pounds, OZ=Ounces, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

This report is due to the Department NO LATER THAN February 1 of the year following the calendar year for which the report is being submitted.

44-15-26(12/96)

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bureau of Pesticides & Radiation - Albany, New York 12233-7259

Commercial Applicators Annual Report - Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
100-801	Ridomil Gold	16	FL	0827	47	3059 Sound Ave	Riverhead	11901
100-720	Ridomil Copper	3.75	LB	0905	"	"	"	"
50534-201	Bravo Ultrex	.245	LB	0910	"	"	"	"
228-36	Dipel 4L	2.8	FL	0910	"	"	"	"
"	"	8	FL	0918	"	"	"	"
"	"	4	FL	0926	"	"	"	"
"	"	4	FL	0926	"	"	"	"
"	"	8	FL	1010	"	"	"	"
"	"	8	FL	1024	"	"	"	"
"	"	4	FL	1031	"	"	"	"
10182-96	Warrior	.9	FL	0925	"	"	"	"

*County: Use County Code On Back

**Units: LB=Pounds, OZ=Ounces, GL=Gallons, FL=Fluid Ounces, L=Liters, ML=Milliliters, KG=Kilograms, GM=Grams

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44-15-26(12/96)

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bureau of Pesticides & Radiation - Albany, New York 12233-7259

Commercial Applicators Annual Report - Pesticides Used

Please read instructions on reverse side before filling out this form. Reports that are not filed in accordance with these instructions will be rejected.

PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

Report Year: 1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-354	Benlate	2	OZ	0905	47	3059 Sound Ave	Riverhead	11901
4581-371	Maneb 75DF	170	GM	0807	"	"	"	"
352-394	Lorox DF	6.8	LB	0808	"	"	"	"
7969-58	Poast	137.6	FL	0808	"	"	"	"
524-475	Round-Up Ultra	8	FL	0811	"	"	"	"
3125-457	Provado 1.6F	3.75	FL	0815	"	"	"	"
"	"	148	ML	0830	"	"	"	"
"	"	2	FL	1024	"	"	"	"
"	"	2	FL	1010	"	"	"	"
3125-320	Bayleton	8	OZ	0825	"	"	"	"
59639-26	Orthene 75S	227	GM	0820	"	"	"	"

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Commercial Applicators Annual Report - Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
10182-018	Ambush	6.4	FL	0723	47	3059 Sound Ave	Riverhead	11901
"	"	60.1	FL	0728	"	"	"	"
3125-280	Monitor 4	4	FL	0801	"	"	"	"
"	"	4	FL	0820	"	"	"	"
"	"	8	FL	0910	"	"	"	"
618-98	Agrimek	33.6	FL	0804	"	"	"	"
352-515	Asana XL	2.4	FL	0807	"	"	"	"
352-354	Bevlate	2	OZ	0807	"	"	"	"
"	"	1.5	OZ	0807	"	"	"	"
"	"	1.5	OZ	0815	"	"	"	"
"	"	2	OZ	0815	"	"	"	"

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New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bureau of Pesticides & Radiation - Albany, New York 12233-7259

Commercial Applicators Annual Report - Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C16683346	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

Report Year: 1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-515	ASANA	19.2	FLOZ	0825	47	3059 Sound Ave	Riverhead	11901
655-736	PBO-8	25	FL	0721	"	"	"	"
"	"	3	FL	0723	"	"	"	"
352-515	ASANA	45	FL	0728	"	"	"	"
655-736	PBO-8	28	FL	0728	"	"	"	"
"	"	28	FL	0811	"	"	"	"
7969-58	Ponst	10	FL	0721	"	"	"	"
"	"	12	FL	0721	"	"	"	"
"	"	6.4	FL	0721	"	"	"	"
10182-83	Reflex	20	FL	0721	"	"	"	"
"	"	9.6	FL	0721	"	"	"	"

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C16683 46	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-384	Lannate LV	6.5	OZ	0915	47	3059 Sound Ave	Riverhead	11901
4581-116	Krydcide	50.4	LB	0712	"	"	"	"
59639-26	Orthene 75S	148	GM	0807	"	"	"	"
"	"	.7	LB	0814	"	"	"	"
10163-220	MetaSystox R	13.6	FL	0718	"	"	"	"
"	"	16	FL	0728	"	"	"	"
352-515	ASANA	37.8	FL	0721	"	"	"	"
"	"	4.5	FL	0723	"	"	"	"
"	"	41	FL	0731	"	"	"	"
"	"	45	FL	0811	"	"	"	"
"	"	38.4	FL	0820	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-384	Lannate LV	30	OZ	0815	47	3059 Sound Ave	Riverhead	11901
"	"	20	OZ	0819	"	"	"	"
"	"	13	OZ	0820	"	"	"	"
"	"	13	OZ	0825	"	"	"	"
"	"	13	OZ	0827	"	"	"	"
"	"	13	OZ	0829	"	"	"	"
"	"	6.4	OZ	0902	"	"	"	"
"	"	6.5	OZ	0905	"	"	"	"
"	"	6.5	OZ	0908	"	"	"	"
"	"	6.5	OZ	0910	"	"	"	"
"	"	6.5	OZ	0912	"	"	"	"

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Commercial Applicators Annual Report - Pesticides Used

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

Report Year: 1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-384	Lannate LV	40	FL	0717	47	3059 Sound Ave	Riverhead	11901
"	"	48	FL	0723	"	"	"	"
"	"	32	FL	0728	"	"	"	"
"	"	32	FL	0730	"	"	"	"
"	"	32	FL	0801	"	"	"	"
"	"	24	FL	0804	"	"	"	"
"	"	16	FL	0804	"	"	"	"
"	"	24	FL	0806	"	"	"	"
"	"	30	FL	0808	"	"	"	"
"	"	30	FL	0811	"	"	"	"
"	"	30	FL	0813	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell Univers. th/ LIHRL

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
50534-201	Bravo Ultrex	.5	LB	0925	47	3059 Sound Ave	Riverhead	11901
"	"	.35	LB	0926	"	"	"	"
"	"	.7	LB	1010	"	"	"	"
"	"	.35	LB	1031	"	"	"	"
59639-89	Orthene 75SP	10.6	OZ	0710	"	"	"	"
"-26	" 75S	147	GM	0729	"	"	"	"
"	"	295	GM	0820	"	"	"	"
"	"	262	GM	0830	"	"	"	"
"	"	262	GM	0925	"	"	"	"
352-384	Lannate LV	8	FL	0711	"	"	"	"
"	"	26	FL	0714	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
50534-201	Brand Ultrex	5.4	LB	0825	47	3059 Sound Ave	Riverhead	11901
"	"	5.18	LB	0828	"	"	"	"
"	"	1.25	LB	0829	"	"	"	"
"	"	748.4	GM	0830	"	"	"	"
"	"	5.4	LB	0905	"	"	"	"
"	"	.8	LB	0905	"	"	"	"
"	"	.35	LB	0910	"	"	"	"
"	"	6.75	LB	0916	"	"	"	"
"	"	.7	LB	0918	"	"	"	"
"	"	.14	LB	0925	"	"	"	"
"	"	.5	LB	0925	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
1668346	Bennett Orlowski	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
50534-201	Bravo Ultrex	3	OZ	0707	47	3059 Sound Ave	Riverhead	11901
"	"	5.8	LB	0721	"	"	"	"
"	"	6.58	LB	0728	"	"	"	"
"	"	.5	LB	0728	"	"	"	"
"	"	1	LB	0728	"	"	"	"
"	"	227	GM	0729	"	"	"	"
"	"	6.58	LB	0804	"	"	"	"
"	"	363	GM	0814	"	"	"	"
"	"	6.58	LB	0811	"	"	"	"
"	"	5.18	LB	0820	"	"	"	"
"	"	.175	LB	0820	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
10182-35	Ambush 25W	9.75	OZ	0620	47	3059 Sound Ave	Riverhead	11901
"	"	12.8	OZ	0623	"	"	"	"
"	"	12.8	OZ	0626	"	"	"	"
"	"	53	OZ	0628	"	"	"	"
"	"	1.3	OZ	0707	"	"	"	"
"	"	3.4	OZ	0717	"	"	"	"
"	"	60.1	OZ	0811	"	"	"	"
279-3158	Command 3ME	64	FLOZ	0624	"	"	"	"
"	"	83.2	FLOZ	0624	"	"	"	"
50534-201	Bravo Ultrex	5.8	LB	0707	"	"	"	"
"	"	.5	LB	0717	"	"	"	"

*County: Use County Code On Back

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C16683 46	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University L.I.H.R.L.

Report Year: 1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
1812-334	Kocide DF	.8	LB	0616	47	3059 Sound Ave	Riverhead	11901
"	"	.8	LB	0626	47	"	"	"
"	"	.5	LB	0717	"	"	"	"
"	"	.5	LB	0717	"	"	"	"
"	"	1	LB	0707	"	"	"	"
"	"	227	GM	0729	"	"	"	"
"	"	227	GM	0729	"	"	"	"
"	"	225	Gm	0807	"	"	"	"
"	"	148	Gm	0820	"	"	"	"
100-607	Ridomil 2E	208	FL	0619	"	"	"	"
100-801	Ridomil Gold	12	FL	0619	"	"	"	"

*County: Use County Code On Back

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	066985	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
4581-371	Maneb 75 DF	.6	LB	0616	47	3059 Sound Ave	Riverhead	11901
"	"	1.5	LB	0626	"	"	"	"
"	"	.75	LB	0707	"	"	"	"
"	"	.375	LB	0717	"	"	"	"
"	"	.375	LB	0717	"	"	"	"
"	"	170	GM	0729	"	"	"	"
"	"	170	GM	0729	"	"	"	"
"	"	.5	LB	0820	"	"	"	"
"	"	170	GM	0820	"	"	"	"
524-475	Round-UP Pro	96	FL	0617	"	"	"	"
"	"	64	FL	0619	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C166 8346	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University, L.I.H.R.L.

Report Year: 1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-394	MANZATE	.75	LB	0616	47	3059 Sound Ave	Riverhead	11901
"	"	8.4	LB	0628	"	"	"	"
352-449	"	8.4	LB	0712	"	"	"	"
"	"	.75	LB	0723	"	"	"	"
34704-610	Curbit FC	22.4	FL	0609	"	"	"	"
"	"	64	FL	0624	"	"	"	"
"	"	64	FL	0624	"	"	"	"
10163-222	Prefar 6E	38.4	FL	0609	"	"	"	"
264-316	Sevin 80S	6.9	OZ	0609	"	"	"	"
"	"	.13	LB	0624	"	"	"	"
"	"	1.5	LB	0905	"	"	"	"

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44-15-26(12/96)

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bureau of Pesticides & Radiation - Albany, New York 12233-7259

Commercial Applicators Annual Report - Pesticides Used

Please read instructions on reverse side before filling out this form. Reports that are not filed in accordance with these instructions will be rejected.

PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University L.I.H.R.L.

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
100-585	Aatrex Nine-O	9	OZ	0610	47	3059 Sound Ave	Riverhead	11901
"	"	1.6	LB	0625	"	"	"	"
"	"	.6	LB	0711	"	"	"	"
62719-116	Treflan M.T.F	32	FL	0513	"	"	"	"
"	"	24	FL	0609	"	"	"	"
"	"	4	FL	0616	"	"	"	"
"	"	8	FL	0715	"	"	"	"
"	"	9.6	FL	0827	"	"	"	"
352-394	MANZATE	5.25	LB	0609	"	"	"	"
"	"	.5	LB	0609	"	"	"	"
"	"	6.3	LB	0616	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University L.I.H.R.L

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
100-673	Dual 8E	36	FLOZ	0625	47	3059 Sound Ave	Riverhead	11901
"	"	12	FLOZ	0711	"	"	"	"
"	"	18	FLOZ	0829	"	"	"	"
352-470	Blade x 4L	12	FLOZ	0513	"	"	"	"
"	"	9.6	FLOZ	0505	"	"	"	"
"	"	12	FLOZ	0530	"	"	"	"
"	"	22	FLOZ	0530	"	"	"	"
"	"	12	FLOZ	0610	"	"	"	"
"	"	36	FLOZ	0625	"	"	"	"
100-585	Aatrex 9-0	9	OZ	0513	"	"	"	"
"	Aatrex Nine-O	1.1	LB	0530	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University, L.I.H.R.L.

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
10182-178	RoNeet 6E	.75	GL	0422	47	3059 Sound Ave	Riverhead	11901
62719-112	Surflan A.S.	76.8	FLOZ	0425	47	"	"	"
100-673	Dual 8E	68.8	FLOZ	0501	"	"	"	"
"	"	8	FLOZ	0501	"	"	"	"
"	"	9.6	FLOZ	0505	"	"	"	"
"	"	12	FLOZ	0513	"	"	"	"
"	"	12	FLOZ	0530	"	"	"	"
"	"	24	FLOZ	0530	"	"	"	"
"	"	12	FLOZ	0610	"	"	"	"
"	"	80	FLOZ	0611	"	"	"	"
"	"	6	FLOZ	0616	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Rennett Orlowski Jr	06695	1997

Applicator Address (Street, City, Zip Code): 3059 Sound Ave Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University L.I.H.R.L.

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
707-174	Goal 1.6E	59.2	FLOZ	0325	47	3059 Sound Ave	Riverhead	11901
10182-280	Gramoxone Extra	28.8	FLOZ	0325	"	"	"	"
"	"	63	FLOZ	0909	"	"	"	"
"	"	30	FLOZ	0912	"	"	"	"
3125-422	Admire 2F	11.9	FLOZ	0415	"	"	"	"
"	"	8.4	FLOZ	0416	"	"	"	"
"	"	1.7	FLOZ	0422	"	"	"	"
"	"	18	FLOZ	0423	"	"	"	"
"	"	8.4	FLOZ	0430	"	"	"	"
10182-340-773	Havoc	300	GM	0421	"	"	"	"
"	"	300	GM	0513	"	"	"	"

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Commercial Applicators Annual Report - Pesticides Used

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1668346	Bennett Orlowski Jr	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business: Cornell University, Long Island Horticultural Research Laboratory

Report Year: 1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
3125-325	Sencor 75DF	227	GM	0318	47	3059 Sound Ave	Riverhead	11901
"	"	2.6	LB	0501	"	"	"	"
"	"	.33	LB	"	"	"	"	"
"	"	30	GM	0513	"	"	"	"
"	"	133	GM	0530	"	"	"	"
10182-258	Devrinol 50DF	227	GM	0318	"	"	"	"
"	"	.8	LB	0530	"	"	"	"
"	"	2	LB	0609	"	"	"	"
"	"	.5	LB	0715	"	"	"	"
"	"	.8	LB	0827	"	"	"	"
352-508	Karmex	227	GM	0318	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1664543	MARK P. SISSON	06695	'97

Applicator Address (Street, City, Zip Code)
10505 SOUND AVE
MATTITUCK NY 11952

Name of Registered Pesticide Business
LONG ISLAND HORTICULTURAL RESEARCH LABORATORY

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C 1011185	Robert C. Neese		

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business

					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1661566	ALICE WISE	06695	1997

Applicator Address (Street, City, Zip Code): LONG ISLAND HORTICULTURAL RESEARCH LAB, 3059 SOUND AVE., RIVERHEAD, NY 11901

Name of Registered Pesticide Business: LONG ISLAND HORTICULTURAL RESEARCH LAB

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
352-354	Benlate	3.2	OZ	1-27-97	47	3059 Sound Ave.	Riverhead	11901
352-354	Benlate	3.2	OZ	1-28	"	"	"	"
352-354	Benlate	1.6	OZ	2-4	"	"	"	"
862-11-34704	Clean Crop 6E Spray Oil	1.4	GL	4-24	"	"	"	"
352-449	Manzate 200DF	4.5	LB	5-16	"	"	"	"
65564-1	JMS Stylet Oil	0.68	GL	5-16	"	"	"	"
707-221	Nova 40W	6.0	OZ	5-27	"	"	"	"
352-449	Manzate 200DF	4.5	LB	5-27	"	"	"	"
524-475	Roundup Ultra	312	ML	5-27	"	"	"	"
524-475	Roundup Ultra	624	ML	5-28	"	"	"	"
524-475	Roundup Ultra	312	ML	5-29	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C16615766	ALICE WISE	06695	1997

Applicator Address (Street, City, Zip Code): LONG ISLAND HORTICULTURAL RESEARCH LAB, 3059 SOUND AVE, RIVERHEAD, NY 11901

Name of Registered Pesticide Business: LONG ISLAND HORTICULTURAL RESEARCH LAB

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
65564-1	JMS Stylet Oil	1.05	GL	6-5	47	3059 Sound Ave.	Riverhead	11901
352-449	Manzate 200 DF	4.5	LB	6-5	"	"	"	"
352-354	Benlate	840	GM	6-5	"	"	"	"
707-221	Nova 40W	146	GM	6-16	"	"	"	"
352-449	Manzate 200 DF	3.9	LB	6-16	"	"	"	"
707-221	Nova 40W	146	GM	6-27	"	"	"	"
352-449	Manzate 200DF	3.9	LB	6-27	"	"	"	"
10163-184	Quidan	300	GM	7-1	"	"	"	"
524-475	Roundup Ultra	1248	ML	7-7	"	"	"	"
65564-1	JMS Stylet Oil	5.4	L	7-8	"	"	"	"
352-449	Manzate 200DF	4.5	LB	7-8	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C166 1566	ALICE WISE	06695	1997

Applicator Address (Street, City, Zip Code): LONG ISLAND HORTICULTURAL RESEARCH LAB 3059 SOUND AVE. RIVERHEAD, NY 11901

Name of Registered Pesticide Business: LONG ISLAND HORTICULTURAL RESEARCH LAB

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
707-221	Nova 40W	172	GM	7-18	47	3059 Sound Ave.	Riverhead	11901
10163-184	Quidan	3.0	LB	7-18	"	"	"	"
352-449	Manzate 200DF	4.5	LB	7-18	"	"	"	"
65564-1	JMS Stylet Oil	4.5	L	7-31	"	"	"	"
10163-184	Quidan	3.0	LB	7-31	"	"	"	"
55146-64	Champ	943	ML	8-7	"	"	"	"
524-475	Roundup Ultra	936	ML	8-8	"	"	"	"
55146-64	Champ	943	ML	8-15	"	"	"	"
264-453	Rovral	2.0	LB	8-15	"	"	"	"
65564-1	JMS Stylet Oil	4.5	L	8-19	"	"	"	"
264-453	Rovral	1208	GM	8-25	"	"	"	"

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1661566	ALICE WISE	06695	1997

Applicator Address (Street, City, Zip Code): LONG ISLAND HORTICULTURAL RESEARCH LAB, 3059 SOUND AVE., RIVERHEAD, NY 11901

Name of Registered Pesticide Business: LONG ISLAND HORTICULTURAL RESEARCH LAB

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
55146-64	Champ	943	ML	8-25	47	3059 Sound Ave.	Riverhead	11901

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Division of Solid and Hazardous Materials
Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1800191	Douglas M. Gergela		1997

Applicator Address (Street, City, Zip Code)
3059 Sound Ave. Riverhead NY 11901

Name of Registered Pesticide Business

Additional Record Keeping Requirements

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code	Target Pest	Method of Application	Dosage Rate	Init
34704-730	Potato Seed Treater	4	LB	4/8/97	47	3059 Sound Ave.	Riverhead	11901				
618-101	Agrimycin 17	2.3	GM	5/7/97	47	3059 Sound Ave.	Riverhead	11901				
100-597	Dual 8E	22.2	ML	5/8/97	47	3059 Sound Ave.	Riverhead	11901				
352-470	Bladex 4L	16.6	ML	5/8/97	47	3059 Sound Ave.	Riverhead	11901				
100-585	Aatrex Nine-0	1.98	GM	5/8/97	47	3059 Sound Ave.	Riverhead	11901				
na	Crop Oil Concentrate	5.9	ML	5/8/97	47	3059 Sound Ave.	Riverhead	11901				
618-101	Agrimycin 17	2.3	GM	5/13/97	47	3059 Sound Ave.	Riverhead	11901				
618-101	Agrimycin 17	2.3	Gm	5/19/97	47	3059 Sound Ave.	Riverhead	11901				
1677-43	Ster-Bac	6	OZ	5/21/97	47	3059 Sound Ave.	Riverhead	11901				

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Bureau of Pesticides & Radiation - Albany, New York 12233-7259

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1200378	Joseph B. Sieczka	06695	

Applicator Address (Street, City, Zip Code)
3059 Sound Ave
Riverhead, N.Y. 11901

Name of Registered Pesticide Business
Cornell University LIHRL

1997

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C-7685457	Andrew T. Corbin	06695	

Applicator Address (Street, City, Zip Code): 3059 Sound Ave. Riverhead, NY 11901

Name of Registered Pesticide Business: Cornell University LIHRL

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1297811	GERARD H. ZELTMANN	06695	1997

Applicator Address (Street, City, Zip Code)
3059 SOUND AVE.
RIVERHEAD, N.Y. 11901

Name of Registered Pesticide Business: Cornell University
LIHRL

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1007432	RALPH N FREEMAN		1997

Applicator Address (Street, City, Zip Code): 600 DANECROST LANE, MATTITUCK, NY 11952

Name of Registered Pesticide Business:

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
279-3105	Talstar	22.4 ml	ml	0408 0506	47	Sound Ave	Riverhead	11901
3125-452-59807	MARATHON	1040 gm	gm	1013	47	Sound Ave.	Riverhead.	11901
400-433	Tenaguard	2.4 oz	oz	1015 1115	47	Sound Ave	Riverhead	11901

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44-15-26(12/96)

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bureau of Pesticides & Radiatich - Albany, New York 12233-7259

Commercial Applicators Annual Report - Pesticides Used

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PLEASE TYPE

Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1684057	Nina Shishkoff		1997

Applicator Address (Street, City, Zip Code): LIHRL 3059 Sound Ave, Riverhead NY 11901

Name of Registered Pesticide Business:

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
7969-58	Poast	40	ML	7/29/97	47	LIHRL 3059 Sound Ave	Riverhead	11901
7969-58	Poast	40	ML	8/5/97	47	LIHRL 3059 Sound Ave	Riverhead	11901

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Bureau of Pesticides and Radiation—Albany, New York 12233-7259

Commercial Applicators Annual Report—Pesticides Used

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1619786	Dale D. Moyer	6695	1997

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business
650 Bay Ave. Mattituck, NY 11952	Cornell University, Long Island Hort. Research Lab

					LOCATION OF APPLICATION (SEE NOTE ON BACK)			
Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
3125-422	Admire 2F	5.5	ml	0430	47	3059 Sound Ave.	Riverhead	11901
3125-457	Provado 1.6 F	1.2	ml	0616	47	3059 Sound Ave.	Riverhead	11901
618-98	Agri-Mek	2.5	ml	0616	47	3059 Sound Ave.	Riverhead	11901
58998-16	Novodor	70	ml	0616	47	3059 Sound Ave.	Riverhead	11901
3125-457	Provado 1.6 F	1.2	ml	0621	47	3059 Sound Ave.	Riverhead	11901
3125-457	Provado 1.6 F	1.2	ml	0623	47	3059 Sound Ave.	Riverhead	11901
618-98	Agri-Mek	2.5	ml	0623	47	3059 Sound Ave.	Riverhead	11901
58998-16	Novodor	70	ml	0623	47	3059 Sound Ave.	Riverhead	11901
618-98	Agri-Mek	6.5	ml	0630	47	3059 Sound Ave.	Riverhead	11901
58998-16	Novodor	70	ml	0630	47	3059 Sound Ave.	Riverhead	11901
3125-280	Monitor	250	ml	0630	47	3059 Sound Ave.	Riverhead	11901
352-449	Mnazate 200	0.5	lb	0630	47	3059 Sound Ave.	Riverhead	11901
618-98	Agri-Mek	7.5	ml	0702	47	3059 Sound Ave.	Riverhead	11901

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1619786	Dale D. Moyer	6695	1997

Applicator Address (Street, City, Zip Code)
650 Bay Ave.
Mattituck, NY 11952

Name of Registered Pesticide Business
Cornell University, Long Island Hort. Research Lab

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
3125-457	Provado 1.6 F	1.2	ml	0705	47	3059 Sound Ave.	Riverhead	11901
3125-457	Provado 1.6 F	1.2	ml	0707	47	3059 Sound Ave.	Riverhead	11901
58998-16	Novodor	70	ml	0707	47	3059 Sound Ave.	Riverhead	11901
58998-16	Novodor	70	ml	0714	47	3059 Sound Ave.	Riverhead	11901
3125-457	Provado 1.6 F	3.6	ml	0714	47	3059 Sound Ave.	Riverhead	11901
618-98	Agri-Mek	2.5	ml	0714	47	3059 Sound Ave.	Riverhead	11901
618-98	Agri-Mek	2	fl	0721	47	3059 Sound Ave.	Riverhead	11901
3125-280	Monitor	250	ml	0713	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	209	g	0713	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	3.75	g	0713	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	209	g	0721	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	3.75	g	0721	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	74	g	0728	47	3059 Sound Ave.	Riverhead	11901

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1619786	Dale D. Moyer	6695	1997

Applicator Address (Street, City, Zip Code)	Name of Registered Pesticide Business
650 Bay Ave. Mattituck, NY 11952	Cornell University, Long Island Hort. Research Lab

Col 1 EPA Registration Number	Col 2 Product Name	Col 3 Quantity Used	Col 4 Units**	Col 5 Date of Appl.	LOCATION OF APPLICATION (SEE NOTE ON BACK) Col 6 County Code*	Col 7 Address	Col 8 Municipality (City Village, etc.)	Col 9 Zip Code
50534-201	Bravo Ultrex	136.4	g	0806	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	54.6	g	0812	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	41	g	0819	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	27	g	0825	47	3059 Sound Ave.	Riverhead	11901
50534-201	Bravo Ultrex	27	g	0904	47	3059 Sound Ave.	Riverhead	11901
50534-191	Bravo C/M	82	g	0910	47	3059 Sound Ave.	Riverhead	11901
50534-191	Bravo C/M	90	g	0917	47	3059 Sound Ave.	Riverhead	11901
50534-191	Bravo C/M	90	g	0924	47	3059 Sound Ave.	Riverhead	11901
50534-191	Bravo C/M	90	g	1003	47	3059 Sound Ave.	Riverhead	11901

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1674151	William S Clark	066695	97

Applicator Address (Street, City, Zip Code): — 246 Griffing Ave Riverhead NY 11901

Name of Registered Pesticide Business: Cornell U LIHRL

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
1812-346	SPINOUT	1.5	GAL	0427	47	3059 SOUND AVE	Riverhead	11901
1812-346	SPINOUT	0.25	GAL	0505	47	3059 Sound Ave	RIVERHEAD	11901
62719-113	Surflan A.S.	.027	gT	0517	47	3059 Sound Ave	Riverhead	11901
264-538	Ronstar 50 wp	.44	LB	0517	47	3059 Sound Ave	Riverhead	11901
524-457	Round up	100	mL	0622	47	3059 Sound Ave	RIVERHEAD	11901
59639-26	ORTHENE TTO	.05	LB	0630	47	3059 Sound Ave	Riverhead	11901
62719-113	Surflan	56	mL	0828	47	3059 Sound Ave	Riverhead	11901
100-526	PRINCEP	19	ml	0828	47	3059 Sound Ave	Riverhead	11901
100-619	SUBDUE 2E	8.85	ml	0905	47	3059 Sound Ave	Riverhead	11901
62719-113	Surflan	30	ml	0920	47	3059 Sound Ave	Riverhead	11901
100-526	Princep	9.5	ml	0920	47	3059 Sound Ave	Riverhead	11901

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Certification ID Number	Applicator Name	Applicator Business Registration No.	Report Year
C1674151	William S Clark	06695	97

Applicator Address (Street, City, Zip Code): 246 Griffing Ave Riverhead NY 11901

Name of Registered Pesticide Business: Cornell U. LIHRL

LOCATION OF APPLICATION (SEE NOTE ON BACK)

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Used	col 4 Units**	col 5 Date of Appl.	col 6 County Code*	col 7 Address	col 8 Municipality (City, Village, etc.)	col 9 Zip Code
58185-27	Rout	939	gm	10/6	47	3059 Sound Ave	Riverhead	11901
58185-27	Rout	182	gm	10/6	47	3059 Sound Ave	Riverhead	11901

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Commercial Permittee Restricted or Agricultural Pesticide ~~Sales~~ USE Report

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EASE TYPE

Certification Permit Number	Name	Reporting Year
C1013545	SANOK, WILLIAM J.	

Address	State	Zip Code
CCE 246 GRIFFING AVE RIVERHEAD	NY	11901

col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Sold	col 4 Units**	col 5 Date Sold	col 6 County Code*	LOCATION OF INTENDED APPLICATION col 7 Address	 col 8 Town or City	col 9 Zip Code
NO PESTICIDES USED								

nty: Use County Code On Back

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Commercial Permittee Restricted or Agricultural Pesticide ~~Sales~~ USE Report

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EASE TYPE

ertification Permit Number	Name	Reporting Year
C1658061	POPOWITCH, CARYN	

ddress	State	Zip Code
CCE 246 GRIFFING AVE RIVERHEAD	NY	11901

					LOCATION OF INTENDED APPLICATION			
col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Sold	col 4 Units**	col 5 Date Sold	col 6 County Code*	col 7 Address	col 8 Town or City	col 9 Zip Code
NO PESTICIDES USED								

nty: Use County Code On Back

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Commercial Permittee Restricted or Agricultural Pesticide ~~Sales~~ USE Report

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EASE TYPE

ertification Permit Number	Name	Reporting Year
C1665606	KIANG, CAROLINE	

ddress	State	Zip Code
CCE 246 GRIFFING AVE RIVERHEAD	NY	11901

					LOCATION OF INTENDED APPLICATION			
col 1 EPA Registration Number	col 2 Product Name	col 3 Quantity Sold	col 4 Units**	col 5 Date Sold	col 6 County Code*	col 7 Address	col 8 Town or City	col 9 Zip Code
NO PESTICIDES USED								

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