



# Annual Report 2003



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# ANNUAL REPORT OF THE IR-4 PROJECT (NRSP-4/IR-4)

## January 1, 2003 - December 31, 2003

### INTRODUCTION

#### BACKGROUND

The Interregional Research Project No. 4 (IR-4 Project) was organized 40 years ago by the Directors of the State Agricultural Experiment Stations (SAES) to obtain regulatory clearances for crop protection chemicals on specialty or minor food crops when the economic incentives for the registrants precluded private sector investment. IR-4 has been administered by the United States Department of Agriculture (USDA) and Cooperative State Research Education and Extension Service (CSREES) since its inception in 1963. The Agricultural Research Service (ARS) component of the USDA established a companion minor use program in 1976 to provide further program support. The objectives of the program were expanded in 1977 to include registration of pest control products for the protection of nursery, floral, forestry, Christmas trees, and turf crops and again in 1982 when the objective of clearance of biological control agents or biopesticides was added. Also in 1982, the project added a Minor Use Animal Drug component to the work effort. The animal drug portion of the program became a separate entity several years later and continues today as a separate project funded by CSREES. The IR-4 Project works as a model government funded program due to a unique partnership formed between the USDA (CSREES and ARS), the IR-4 Headquarters and Regional Leader Laboratory staff, the land grant university system, the crop protection industry, commodity and grower groups, the Environmental Protection Agency (EPA), and the California Department of Pesticide Regulation (CDPR) to bring crop protection solutions to specialty crop growers.

#### PROGRAMS

##### Food Use Program

In order for the program to respond to the pest control needs of minor crop growers, project requests are solicited from growers, commodity groups, university researchers and extension personnel, USDA researchers and other interested parties and are prioritized at the Food Use Workshop held in September of each year. The Workshop high priority projects are finalized at the October National Research Planning Meeting where field residue and analytical laboratory assignments are made for the following year based on the best use of available USDA-ARS and land grant university personnel within the funding provided by Congress. In 2003, the program scheduled 96 projects with 740 field trials.

Legislative initiatives have played an important role in the strategies for the program over the past 15

years. The 1988 amendments to the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA 88) required a focused program on developing new data to support reregistration of existing products at that time because many of the older products did not have sufficient minor crop sales to justify industry supporting them on those crops. Between 1989 and 1996, the IR-4 FIFRA 88 initiative led to the successful defense of over 700 minor crop registrations.

The passage of the Food Quality Protection Act (FQPA) in 1996 set in motion a new set of challenges which had been foreseen, in part, by the 1996 Strategic Plan. That plan recognized the trend of new, safer, Reduced Risk chemistries and biological control agents being developed by the crop protection industry and their potential value to specialty crop agriculture. These products are extremely safe to mammalian systems as well as birds, wildlife, aquatic species and beneficial organisms, making them ideal for use in integrated pest management (IPM) systems. IR-4 started integrating these new products into the 1997 program; over 30% of the projects that year involved those safer chemistries. This trend has continued and has reached the 70-80% level the past four years. This focused effort has given the program a high level of credibility with the EPA in partnering with them to implement the mandates of FQPA as noted in the Program Cooperation and Coordination Section.

The impact of the FQPA has become clearer in recent years. Residues of the older products in foods have been confirmed to be low or non-detectable and not a health concern. However, some products have been shown to have levels of exposure to farm workers and applicators as part of the aggregate risk assessment process leading to label restrictions, especially for specialty crops. The impact of the cumulative risk assessment on the organophosphate insecticides will likely impose additional minor crop label restrictions. Fortunately, the EPA has worked closely with specialty crop growers and commodity groups to preserve critical uses of certain older products while working with IR-4 to rapidly make available the new products.

##### Ornamentals Program

The leadership of the Ornamentals Program passed from retiring Ray Frank to newly hired Bob Herrick the fourth quarter of 2003. Ray was honored for his 10 years of Ornamentals Program leadership and contributions with the Hall of Fame award. The ornamental industry is an extremely important

component of specialty crop agriculture with over \$12 billion in annual sales which comprise over 25% of all specialty crop sales. The research to develop efficacy and crop safety data to support registration of both traditional chemicals and biopesticides as pest control tools on ornamentals continues to be an important component of our overall program. The industry presents a formidable challenge since it involves a diverse array of crops in various markets such as floral, bulbs, forestry, Christmas trees, nursery, turf, commercial and interior landscapes, greenhouses, etc. Our focus since 1996 on biopesticides and Reduced Risk, safer chemistries for the food use program has also been implemented in the ornamental program with comparable success since the objective of developing pest control solutions that are safe for workers, adaptable to existing cultural practices and are effective in IPM programs is clearly compatible for both programs. Our USDA-ARS partners have expanded IR-4's commitment to the industry by working closely with the EPA and the American Nursery and Landscape Association to continue foliar dislodgeable residue studies to provide accurate data for the Agency's worker exposure risk assessments.

#### **FUTURE DIRECTIONS**

The last two years have given IR-4 an opportunity to observe progress in implementing the 2001 to 2005 Strategic Plan which was approved by the Project Management Committee (PMC) in 2000. The cornerstone of the Plan is to focus on the latest crop protection chemistries and biopesticides as solutions for the pest control needs of specialty crop growers. As noted in the introduction, the program has gone from 30% of our projects in this category in 1997 to nearly 80% in recent years. The Plan also reinforced the importance of the 30-month completion schedule which was initiated in 1999 to speed the registration of new technologies in order to get them into the hands of growers as soon as possible. This year was the third year to judge the submission rate which ended up at over 70%. This number is considered good and could have even been higher if the EPA had the capacity to review more petitions. As it is, the EPA's 2003 Work Plan was comprised of 50% of our projects and this will continue on their 2004 Work Plan. We can hardly ask more of the Agency and greatly appreciate this level of support and cooperation for specialty crop agriculture.

The Strategic Plan also targeted additional support for and emphasis on the Methyl Bromide Alternatives (MBA) Program and the Biopesticide Research Program and associated biopesticide registration support. This past year continued to validate the importance of initiating the MBA Program in 1999 on strawberries and tomatoes in Florida and California. We now have three years of solid research data from large scale, replicated

research trials which demonstrates that currently or soon-to-be registered products, when used in combinations appropriate for the soil type and production systems, provide effective nematode, weed and disease control comparable to the methyl bromide/chloropicrin standard. This is important to growers of these specialty crops since 2005 will eliminate the use of methyl bromide except for critical use exemptions. The program was expanded to mulched vegetables in 2001. In addition, IR-4 has been active in serving as a facilitator to help university researchers obtain \$175,000 USDA funding for the vegetable industry. Further details on this important program are found in a later section.

The Biopesticide Research Program continued its seventh year of competitive grant funding of 43 projects for \$427,000 and amounting to over \$2,500,000 since its inception. In addition to funding projects that have focused in recent years on the biopesticides considered Advanced Stage (near commercialization or commercialized but expanding uses to minor crops), IR-4 has continued to help biopesticide registrants with regulatory advice and petition preparation help, if requested. IR-4 has supported the growth of the Biopesticides Industry Alliance (BPIA) as a trade association of biopesticide companies focused on improving the industry's image, improving product quality and developing standards for product certification. IR-4 is working closely with BPIA and the EPA's Biopesticides and Pollution Prevention Division (BPPD) who regulate biopesticides to speed the registration and grower acceptance of these crop protection tools.

The outreach/communications program underwent changes in 2003 with the retirement of Sandy Perry as National Outreach Specialist and the hiring of Sherrilynn Novack as Communications and Publications Coordinator. Sherrilynn proposed a number of changes to our outreach efforts, starting with a new logo as noted on the front of the report which includes the new tag line of "Providing Safe and Effective Pest Management Solutions for Specialty Crop Growers" which was approved by the PMC. Other changes include a revamped Newsletter, brochure, web site and state specific communication pieces. Additional changes are anticipated in the years ahead to meet the information needs of our stakeholders.

The 2003 Annual Report highlights the progress of IR-4 toward achieving the goal of providing safe and effective chemical and biopesticide options for specialty crop growers which are compatible with IPM programs. The accomplishments, as measured by clearances, were the highest on record with 793 food use clearances including 2 biopesticide food use clearances (compared to the record of 567 in 2000) along with 812 ornamental uses.

**PROJECT:** National Research Service Project No. 4 (NRSP/IR-4). A National Agricultural Program to Clear Pest Control Agents for Minor Uses. January 1, 2003 to December 31, 2003.

**COOPERATING AGENCIES AND PRINCIPAL LEADERS:** Cooperating agencies, principal leaders of the project, support groups and IR-4 State and Federal Liaison Representatives are shown in Attachment 1. Scientists participating in the project are shown in Attachment 2.

## **PROGRESS of WORK and PRINCIPAL ACCOMPLISHMENTS**

### **FOOD USE RESEARCH PROJECTS**

There are currently 9148 IR-4 food-use requests, an increase of 300 over the 8848 requests reported in 2003. Of these, 1176 are researchable projects. In 2003, SAES and USDA-ARS cooperators scheduled research on 96 requested clearance projects (studies) which represented 740 field trials. Residue samples from 671 field trials went to SAES, USDA-ARS, and other cooperating analytical laboratories. Research protocols were prepared or revised for each study as required by EPA Good Laboratory Practice Standards. The chemicals and commodities researched in 2003 are shown in Attachment 3.

### **FOOD USE REGULATORY ACCOMPLISHMENTS**

#### IR-4 Supported Approvals

IR-4 and EPA efforts continue to result in high numbers of new uses for specialty crop growers, with 2003 far exceeding any other year. One hundred and sixty five permanent tolerances, exemptions, or temporary tolerances were established based on IR-4 data. These tolerances support 793 new minor uses that can be added to crop protection chemical labels (Attachment 4). These new uses reflect EPA work on 50 various products. CDPR continues to provide support to the work share program and many of these new uses (nearly 20%) were a result of CDPR's review of residue chemistry data for EPA.

IR-4 data from traditional chemical products resulted in 687 new uses that can be added to product labels. These uses are based on EPA granting 129 tolerances on 29 products. In one case, nearly 100 uses were granted for a single product (i.e. imidacloprid, see Attachment 4). IR-4 data were used to support 2 new biopesticide food uses in 2003. These include *Aspergillus flavus* AF-36 for use in cotton as a final rule and Thymol as a Section 18 tolerance exemption.

IR-4 data were also used to support many of the time-limited Section 18 tolerances established over the past year. A total of thirty-four Section 18 time-limited tolerances were established based on IR-4 data. These Section 18 tolerances supported 104 minor crop uses that in many cases supported uses in multiple states. This number is essentially the same as last year, however it is expected that IR-4 data submissions for permanent tolerances will reduce the number of Section 18's needed in the future. EPA reported that tolerances granted for IR-4 submission in FY 2003 addressed a total of 95 Section 18's that would no longer be required.

In summary, the total new food use clearances supported by IR-4 research in 2003 include: 687 new chemical clearances, 2 new biopesticide clearances and 104 Section 18 uses for a total of 793 new uses.

#### Crop Group Definitions

IR-4 Commitment to Continuing Crop Grouping Project with the EPA. IR-4 has been a leading organization in developing a crop grouping scheme since 1976. The excellent collaboration between IR-4 and EPA through the core working group led by Professor George Markle (former IR-4 Associate Director) and Dr. Bernie Schneider (EPA Senior Scientist) had enabled a five-fold increase in food use

clearances in 1995 (60 Federal Register, No. 95, 5/17/95, and 40 CFR 180.41), and created new possibilities with the successful 2002 USDA/IR-4 International Crop Grouping Symposium. After Professor Markle retired in early 2003, IR-4 committed to continue this collaboration with the EPA and assigned Dr. Hong Chen to this project. IR-4 Senior Management supported Dr. Chen's sabbatical at the EPA/OPP Health Effect Division (HED) and Registration Division (RD) which started in September to assist in completing the crop group updates. Dr. Chen has completed several visits with EPA regarding regulatory training as well as participation in the crop group updates (crop group working team) and ChemSAC. This work is also being coordinated on an international level with Canada and CODEX.

EPA Proposal to Initiate Crop Grouping Updates. The USDA/IR-4 International Crop Grouping Symposium held in Washington, DC, 2002 produced the largest number of crop grouping proposals since 1976 (see summary in Attachment 5). If the new crop grouping proposals are implemented, a minimum of another five-fold increase in food clearances should occur, saving millions of dollars for IR-4 in residue studies and for EPA in petition review costs. In a memo to EPA Minor Use Officer, Hoyt Jamerson dated March 17, 2003, Dr. Bob Holm, Executive Director of IR-4, proposed that the EPA initiate crop grouping updates. For the EPA to start the review process, the proposals from the symposium must be completed with data packages – crop monographs for all the new commodities, updated monographs for existing commodities, and data packages for all the proposed groups, subgroups and definitions including cultural practices, pests, geographical distribution, and tolerance similarities. EPA has committed to work with IR-4 on this process and has designated two senior scientists, Drs. Bernie Schneider and Yuen-shaung Ng to work with Dr. Hong Chen on preparing required proposal data packages. EPA will then form a Crop Grouping Regulation Workgroup including USDA personnel after the proposal packages are submitted and analyzed.

## **REGULATORY PROGRESS**

IR-4's partnership with EPA continues to grow and foster new avenues to registration. IR-4 has significantly increased the number of electronic submissions to EPA over the past year. These submissions enable EPA to review IR-4 petitions more rapidly and with fewer resources. IR-4 is also in the process of reformatting their final reports to an "EPA Recommended Format" which should also help EPA to review IR-4 petitions more rapidly. The IR-4 submission schedule continues to aid EPA in their development of the EPA Work Plan and ensure the most efficient use of EPA resources. EPA's 2004 Work Plan should again result in over 500 new clearances for IR-4 projects. IR-4 has been working hard with EPA to update the existing crop groups. IR-4 has sponsored a personnel exchange with the Health Effects Division in order to see this important project come to completion, hopefully in the next couple of years. Once complete, each IR-4 submission will support even more minor uses. Currently, IR-4 obtains about five minor crop uses for each submission. It is expected that once the new crop groups are complete, IR-4 may be able to expect as many as ten uses per submission. EPA's "Work Share Program" with the CDPR continues to be extremely productive with a large number of new uses resulting from data packages reviewed by CDPR. IR-4 expects the work share with EPA and Canada's Pest Management Regulatory Agency (PMRA) to expand over the next year as four projects have been recently selected for work share.

### Data Package Development

IR-4 submitted 139 data packages to the EPA in 2003 (see Attachment 6) which was slightly lower than the record number of 150 submitted in 2002. This again reflects the result of a lot of hard work by IR-4 personnel at all levels (Field, Laboratory, QA, Regional and Headquarters offices) to meet the IR-4 commitment to the 30-month timeline and to the scheduled submissions with EPA. The current number of projects in line for report writing is 174 (see Attachment 7).

## **ORNAMENTAL RESEARCH AND CLEARANCES**

IR-4 supported 614 ornamental research trials during 2003 to support clearances in floral, nursery, landscape, turf, Christmas tree, and forestry crops. In addition, 271 new project requests were received.

Through the project prioritization process at the Ornamental Workshop, collaborative efforts by the ornamental industry and IR-4 resulted in 812 new ornamental clearances being granted by the EPA (Attachment 8). These included 19 fungicides, 12 insecticides, 11 herbicides, and 2 plant growth regulators. Seven (7) biofungicide reports were also sent to registrants.

## **BIOPESTICIDE RESEARCH AND REGISTRATIONS**

In 2003, the following biopesticide research projects were funded: Efficacy of Bio-Save 10LP on the Postharvest Diseases of Sweet Potato; Pheromone-Based Strategy for Control of Western Poplar Clearwing Moth; Mating Disruption of Codling Moth and Oriental Fruit Moth; Screening EcoGuard for Efficacy Against Pathogens of Vegetables; Screening Endorse for Efficacy Against Pathogens of Ginseng; Use of Selected Fungicides and Biopesticides for Control of Powdery Mildew; Use of Serenade in Fungicide Programs for Blueberries; Lexx-A-Phos Powdery Mildew and Root Rot Trials; Testing of a New Codling Moth Granulosis Virus; Biophos Trials; Control of Foliar and Stem Blights of Potato with Sonata; Evaluating Auxigro to Enhance Cantaloupe Yields; Evaluation of Microencapsulated Verbenone for Protection of Pines; Screening EcoGuard for Efficacy Against Pathogens of Ornamentals; Screening of Biopesticides and Conventional Fungicides for Control of Phytophthora Root Rot and Crown Rot of Squash; Use of Serenade and Sonata to Manage White Mold and Downy Mildew in Lima Beans; Field Evaluation of a Pollinator-Delivered Serenade (*Bacillus subtilis*) for Control of Mummy Berry; Evaluation of BioYield for Induced Systemic Resistance Against Foliar Pathogens of Watermelon and Cantaloupe; Effect of Messenger on Ramularia Leaf Spot and Yields of Artichokes; Evaluating the Efficacy of Auxigro on Blueberries; Control of White Mold in Snap Bean with Sonata; Evaluating Auxigro to Enhance Broccoli Yields; Use of Milsana in Fungicide Programs in Strawberries; Evaluating Auxigro on Sweet Corn for Enhancing the Yield; Efficacy of Serenade Biofungicide on Black Rot of Cabbage; Management of Plant Parasitic Nematodes on Annual Crops with Quillaja; An Integrated Approach to Control of Powdery Mildew of Cucurbits; Evaluating Auxigro to Enhance Bermuda Grass Seed Yields; Integration and Enhancement of Biocontrol Strategies for Management of Rusty Spot on Peach; Evaluation of BioYield for Plant Growth Promotion and Disease Control in Various Ornamental Crops; Examine the Efficacy of Milsana on Greenhouse Tomato; Effect of Messenger on Avocado Root Rot; Efficacy of Serenade and Sonata for Powdery Mildew of Pumpkin; Evaluation of Essential Oils for Managing Lepidopteran Pests in Turfgrass; Evaluating the Effectiveness of Capsaicin for Control of Plum Curculio; Foliar and Root Disease Control in Ornamental Crops; The Use of Kaolin Clay as a Disease Control Option in the Production of Greenhouse Cucumbers; Evaluating the Efficacy of Auxigro on Apples for Enhanced Yield; Effect of AVG on Fruit Set, Retention, and Quality of Lychee; Filed Testing *Bacillus mycoides* Isolate Bac J for Control of Cercospora; Bionematicides for Management of Nematodes in Grapes; Management of Root Knot Nematodes in Tomato, Cucumber and Pepper; Evaluation of KeyPlex 350 DP for Control of Greasy Spot in Citrus; Adapting Two Biopesticides for Onion Thrips; Improving the Production of the Gypsy Moth Pathogen Entomophaga; Field Efficacy of BioAct Biological Nematicide; BIOACT WG A Biological Nematicide; Management of Oriental Beetle, *Exomala orientalis*; Evaluation of Root Rot to Reduce Root Rot of Strawberry; Efficacy of *Beauveria bassiana* for Management of the European Fire Ant.

In 2003, five biopesticide petitions, amendments or data packages were submitted to EPA or the registrant. These are listed in Attachment 9.

## **METHYL BROMIDE ALTERNATIVES (MBA) PROGRAM**

### **SOIL FUMIGATION STUDIES**

IR-4 continued with large scale field evaluations of several candidate methyl bromide replacements in 2003. Trials were run in soil fumigation studies in strawberries and fresh market tomatoes in Florida and in California and they were located in the major production areas for these crops in California and Florida. With the support from IR-4, these trials were run under the direction of Dr. James Gilreath,

University of Florida, Dr. Michael Nelson, Plant Sciences, Inc., Watsonville, CA, and Driscolls Strawberry Associates, Watsonville, CA. Data from these trials were used to support the fast track registrations of fosthiazate nematocide in tomatoes, and dazomet and iodomethane in both crops. These products are pending EPA registration at this writing.

Products approved for use by EPA as a result of priority reviews as methyl bromide alternatives through IR-4 include trifloxysulfuron sodium (Envoke Herbicide) and halosulfuron methyl (Sanda Herbicide).

MULTIGUARD™PROTECT (furfural) was accepted as a methyl bromide alternative candidate by EPA and, as a consequence, a new product registration is pending acceptance by EPA for use on non-edible crops in greenhouses. The product is being fast tracked and a registration decision is expected in June 2004.

Products evaluated in IR-4's 2004 Methyl Bromide Alternatives Programs that were subsequently dropped either because of excessive crop injury and/or poor efficacy included PlantPro 45, and PlantPro 20EC from Ajay, North America, and a biological product from Crompton-Uniroyal Chemical, UCC-A1641.

Products showing efficacy ranging from very good to poor depending upon application procedures, rates, etc and still requiring research to optimize performance include MULTIGUARD™PROTECT, MULTIGUARD™FFA, Propylene Oxide, and SEP-100 (sodium azide). These products will be included in future IR-4 trials to further investigate optimal use patterns and rates.

Two large scale experiments were conducted in Michigan in 2003 by Dr. Mary Hausbeck, Michigan State University, where the primary target pests were soil borne phytopathogenic fungi. These trials were quite data intensive and included two planting dates and seven different mulched vegetables. Significant progress was made in identifying products and product combinations that may help protect specialty crops against *Phytophthora capsici* and *Fusarium* spp. Additional research is needed and is planned for 2004 in Michigan under the auspices of Dr. Hausbeck.

Metam sodium (VAPAM, and other products), 1,3-dichloropropene (Telone/InLine) and chloropicrin were included alone and in various combinations as internal standards in all of IR-4's methyl bromide alternatives trials. These registered fumigant products have limitations as full replacements for methyl bromide, but through the IR-4 program, better application methodology is being investigated and the consistency of performance continues to improve.

## **POST HARVEST**

Propylene oxide was given priority regulatory status by EPA as a product to protect stored agricultural commodities as a result of IR-4's support, and this resulted in new label amendments that include the protection of in-shell nuts and cocoa beans in storage, an important use especially for the nut industry in California. Pending acceptance at EPA are additional label amendments for propylene oxide including extending the period of treatment from 2 hrs to 12 hrs for improved efficacy and the approval of a 92:8% carbon dioxide:propylene oxide mix for all registered uses of propylene oxide alone. This mix would reduce the fire hazard that could be associated with propylene oxide alone.

## **IR-4 SUPPORT**

Grant preparation support for funding by USDA CSREES was provided to a number of university researchers in 2003 and two such proposals were funded. These were proposals for continuing research by Dr. James Gilreath in Florida (\$100,000) and for soil solarization research in Wisconsin by Dr. Ann MacGuidwin (\$75,000). IR-4 will continue to provide this type of support to university researchers in 2004.

IR-4 played an active role in the review of Critical Use Exemptions (CUE's) to allow the use of reduced quantities of methyl bromide beyond the phase out date of December 2004. The total amounts requested in the CUE's for cucurbit vegetables in the Southeastern US and in Michigan were recommended as a consequence of the review and input from IR-4.

## **QUALITY ASSURANCE (QA)**

The IR-4 Project's Quality Assurance Unit (QAU) continues to provide monitoring and support of cooperating scientists throughout the United States and Puerto Rico. Quality Assurance Coordinators have continued conducting on-site facility compliance inspections, in-life critical phase inspections, and raw data and final report audits as required by the Good Laboratory Practice Standards, 40 CFR 160 (GLPs). QA findings, recommendations and documentation of corrective actions (160.35b(3)) were forwarded to the Study Directors and Testing Facility Management.

In addition to their standard duties, members of the IR-4 QAU were involved in seven US EPA GLP compliance inspections. Six IR-4 participating field testing sites and one IR-4 analytical laboratory were audited by the US EPA for GLP compliance and data integrity. A total of 48 IR-4 related facilities have been inspected for GLP compliance since April 27, 1997.

The IR-4 QAU is comprised of Regional QA Coordinators, cooperating university QA Officers and USDA-ARS QA Officers. The IR-4 QAU functions under a set of mutually accepted Standard Operating Procedures (SOPs) by which it maintains consistent monitoring activities of IR-4 GLP research studies. The IR-4 QAU received a set of recommendations from the Project Management Committee (PMC) in response to the findings from the QA Peer Review that was conducted in 2002. A discussion on the implementation of the recommendations from the QA Peer Review was held on Oct. 29, 2003. Seven recommendations were made to the program, and several of them are already being implemented. The basic objective of the IR-4 QAU did not change and it was recognized that the IR-4 QAU is meeting its goals in the most efficient manner possible. Constant improvements are to be made in regards to uniformity, and professionalism is to be maintained at all times by all parties involved in GLP research projects. The GLP compliance program has been enhanced by the formation of a National Training Committee. Management's support and understanding of the goals and objectives of the IR-4 QAU was highlighted as an important recommendation resulting from the Peer Review.

The IR-4 QAU is a cooperative unit. Representatives mutually monitor studies and coordinate activities in an efficient manner. In 2003, regular inspections included 20 facility inspections, more than 214 field in-life inspections (50 conducted by our Canadian QA participants), 78 analytical in-life inspections, 82 analytical summary report/data audits and 615 field data book audits. There were over 68 final reports completed during the 2003 calendar year and a total of 86 final reports audited.

The IR-4 QAU held meetings twice in 2003. The annual QA Planning Meeting was held on February 25-26, 2003 in Washington DC. We were joined by Dr. Al Hammil of Agriculture and Agri- Food Canada (AAFC), who represented the Canadian QA/GLP monitoring program. In March of 2003, AAFC appointed Ms. Helen Penny to be their new Lead QA. Ms. Penny was invited to and attended the fall IR-4 QA meeting, which was held October 28-30, 2003 at IR-4 Headquarters in conjunction with the IR-4 National Research Planning Meeting.

## **PROGRAM COOPERATION AND COORDINATION**

The IR-4 Project continues to pride itself in being a model of interagency cooperation for a federally funded program by forming partnerships with the crop protection industry, the land grant university system, commodity organizations and minor crop groups, our USDA funding agencies (CSREES and ARS) and the EPA to bring the latest crop protection solutions to specialty crop growers. The various organizations and the partnership initiatives are noted below:



- **Crop Protection Industry.** IR-4 would not have new chemical and biological products to make available as crop protection tools for specialty crop growers without the cooperation of the biopesticide and chemical companies who discover, develop, register and market their new technologies. The consolidation that started in the mid-1990's has resulted in the loss of ten companies. We focused considerable effort this past year to keep our contacts with current and new IR-4 company liaisons, senior management and specialty crop business, technical and regulatory teams. Partnership meetings usually last one day but can run two days for our larger partners. These meetings start with updates from Headquarters management on recent IR-4 initiatives and are followed by company news on specialty crop initiatives and information on new technology or current products in IR-4 residue programs. This information exchange allows IR-4 to work closely with the crop protection industry to maximize the potential of their new products by making them aware of pest control voids presented by our stakeholders through Project Clearance Requests, tours, Pest Management Strategic Plans formulated by stakeholders through the IPM Centers and other direct inputs. An initiative started in 2002 was continued this year to share petition submission strategies with registrants and request from them their top EPA registration priorities to allow coordination of as many petitions (IR-4 and registrant) for each active ingredient as possible. This optimization in close consultation with the EPA provides the best use of the Agency's regulatory review capacity to provide the best outcome for all parties involved (IR-4, registrant, EPA and specialty crop growers). Partnership meetings between IR-4 and registrants also allow us the opportunity to access new chemistries for specialty crop growers. Guidelines in previous years were to work with new products only after Section 3 approvals were granted on major row crops. In 2003, IR-4's partnership with Dow AgroSciences resulted in the registration of quinoxyfen on hops, grapes and cherries for disease control as the first U.S. registrations.

The extent of IR-4's interaction with the crop protection industry can be documented by the facts that projects were conducted with 13 companies on 43 products on 90 crops in 2003. In 2004, the number of companies will be the same while the number of products will increase to 52 and the number of crops to 108.

Special thanks in 2003 to BASF, Bayer CropScience, Dow AgroSciences and Syngenta Crop Protection for providing financial support to remodel the outdated Archive Room using metal file cabinets with water/fire protection into a modern moveable file rack system (doubled storage capacity) with state-of-the-art inert gas fire protection. This project protects over \$75 million in data and petitions from the past 10 years and secures the information needed to support the numerous specialty crop registrations obtained in recent years. The funding provided by these companies also allowed us to extend the fire protection system to the Active File and Central Computer Rooms. Without external funding like this and other funds received from our crop protection industry partners for the Food Use and Ornamental Workshops and product specific projects, the accomplishments of the program would not be possible.

- **EPA.** The partnership initiated with the EPA in 1999 with formation of the EPA/IR-4 Technical Working Group (TWG) continued to flourish with three additional meetings bringing the total to 19 the past five years. In addition, two tours (one ornamental and the other tree fruits and vegetables) were sponsored by IR-4 for EPA staff bringing the total to seven since 1999. The EPA sabbaticals by IR-4 staff members started by Dan Kunkel, Assistant Director Registrations, in 2001 and Michael Braverman, Biopesticide Manager, in 2002 were continued by Hong Chen, Associate Coordinator, this past year focusing on the Crop Grouping Project (refer to separate section on this important project). These sabbaticals along with the TWG Meetings have provided IR-4 with great opportunities to explore with the Agency unique regulatory approaches as well as coordinate with Hoyt Jamerson, Minor Use Officer, the Agency's Annual Work Plan. As noted in the previous section, this partnership between the crop protection industry registrants, IR-4 and the EPA has resulted in increased regulatory efficiencies. These efforts resulted in a record 792 specialty crop clearances in 2003 as well as an involvement by IR-4 on 52% of the EPA's 2004 Work Plan. IR-4 is involved with

82% or 41 of the 49 products on the 2004 New Uses for Existing Products Work Plan. IR-4 is the sole submitter for spixonamine (hops) on the 2004 New Product Work Plan and has ongoing projects with 7 of the 18 new active ingredients being reviewed for registration. The partnership initiated in 2001 with the BPPD was continued in 2003 with three IR-4/BPPD TWGroup meetings to explore more efficient ways to improve biopesticide registrations. BPPD continues to provide input into our Biopesticide Research Program on project registration potential and is exploring having IR-4 manage a Biopesticide Demonstration Program funded by BPPD in 2004.

We continue to appreciate the great management support from the EPA by Jim Jones/OPP Director, Debbie Edwards/Director Registration Division, Margaret Stasikowski/Director Health Effects Division and their team members who make the TWG meetings highly productive. We will greatly miss Hoyt Jamerson in his retirement decision and Debbie Edwards and her move to the Special Review and Reregistration Division (SRRD) as Director. However, we look forward to working with Debbie on registration of some specialty crop products in SRRD review as we did with Lois Rossi during her leadership of that division. We also look forward to working with Lois as the RD Director.

- **California's Department of Pesticide Regulation (CDPR).** CDPR joined the EPA/IR-4 TWG in 2000 and has been an extremely productive partner since then. The past three years, the CDPR team has been involved in a work share program with the EPA on IR-4 residue petitions which have amounted to 20% of the IR-4 petitions on the Agency's Work Plan and 10% of the total new uses for existing products. This program continues to be the major contributing factor for the increase from 25% of IR-4 petitions on the 2000 Work Plan to the 50% plus the past three years. The CDPR team has committed to maintaining this level of support in 2004 in spite of the budget restrictions in California. Our thanks go to Paul Helliker, DPR Director, his senior management team (Paul Gosselin, Toby Jones and Barry Cortez) as well as David Supkoff, Senior Regulatory Specialist, who manages the CDPR team working on the IR-4 petitions selected for the work share program. This unique work share benefits everyone involved, especially the California specialty crop growers, who can use newly registered crop protection tools without the usual separate review period.
- **Health Canada's Pest Management Regulatory Agency (PMRA).** PMRA staff have been active participants in the IR-4 Food Use Workshop and National Research Planning Meetings since 1996 and have participated in the planning of over 90 joint field residue trials based on U.S. priorities until 2003. The Canadian minor crop funding initiative this past year has supported the hiring of PMRA reviewers dedicated to minor crop reviews. We have continued to work with Imme Gerke, Minor Use Adviser, in exploring opportunities for joint work share projects. Our Project Management Committee met in Ottawa in July to explore additional partnership opportunities with Clair Franklin, PMRA Director, who retired in the fall of 2003. Subsequently, Jim Jones/OPP Director and Bob Holm/IR-4 Executive Director met with Wendy Sexsmith, Acting PMRA Director, Richard Aucoin/Acting Registrar, and senior Agriculture and Agriculture Food Canada (AAFC) management in Ottawa to discuss joint submission/work share petition review projects. This initiative was pursued at the December NAFTA Technical Working Group Meeting in Vancouver, B.C. and four IR-4 petitions were selected as a pilot 2004 project between the EPA and PMRA.
- **Agriculture and Agri-Food Canada (AAFC).** Prior to 2002, AAFC funded the previously mentioned joint US/Canada field residue trials through the Canadian Horticultural Council (CHC). With the Canadian minor crop initiative, the AAFC team has set up six Field Research Centers with ten locations, a Pest Management Centre in Ottawa, hired an Executive Director, Study Directors, QA staff, Field Research Directors and management and a Coordinator of Canada/US IR-4 projects (Shirley Archambault formerly of the CHC who has worked on the joint projects since 1996). Mary Komarynsky/Director General of AAFC has been very supportive of the Canadian partnership initiatives with IR-4 which resulted in 61 joint trials conducted by the AAFC Team in 2003 and 52 joint trials planned in 2004 on 12 active ingredients on 12 crops of interest to both U.S. and Canadian specialty crop growers. IR-4 was asked to participate in the March 2003 Canadian Minor Use Workshop and learned several new techniques and processes which were integrated into our

September Food Use Workshop. The Canadian partnership has the potential to conduct as many joint work share petitions for specialty crop registrations as are currently being accomplished by CDPR with the added benefit of removing potential trade barriers for specialty crop growers in the U.S. who currently are restricted in exporting their crops to Canada due to a lack in a tolerance (MRL) in Canada for some of the crop protection tools recently registered by IR-4.

- **Commodity Liaison Committee (CLC)**. The CLC continued under the strong leadership of Chair Rocky Lundy, Executive Director of the Mint Industry Research Council. The CLC provides direct input into the program by Rocky's active participation on the Project Management Committee (PMC) to develop policies, procedures and budgets. Other CLC involvement occurs at the Food Use and Ornamental Workshops. The CLC met jointly with the PMC in February in Washington, DC to discuss items of mutual interest and participate in the 40<sup>th</sup> IR-4 Anniversary Celebration sponsored by the CLC for the IR-4 staff, CLC members, growers and Congressional staff.
- **Workshops**. As noted in the Introduction, the Food Use and Ornamental Workshops continue to be a critical component of the overall program to provide stakeholder input into the prioritization of the most important pest control needs. The Food Use Workshop was held in Portland, Oregon on September 16<sup>th</sup> to 18<sup>th</sup> with over 200 participants. The Ornamental Workshop was held in Windsor, Connecticut from October 20<sup>th</sup> to 22<sup>nd</sup> followed by a tour on the 23<sup>rd</sup>. Over 125 stakeholders attended this Workshop led by Bob Herrick, newly hired Ornamentals Manager. The meeting also served as an opportunity to honor Ray Frank, retiring Ornamentals Manager, for his 10 years of fine service to the program with the Hall of Fame award, the highest award granted by IR-4 for outstanding service and accomplishments.

## **USEFULNESS OF FINDINGS**

IR-4 goes through an extensive process each year to obtain input on the most critical pest control needs of specialty crop producers and to prioritize those research needs using committees of regional and national level agriculture experts to best match the program's resources with the current unmet needs. IR-4 provides program coordination, technical guidance and funding for both field and laboratory research to develop residue and other data required by the EPA to register specialty crop pest control solutions. All IR-4 food use residue research is carried out by EPA approved GLP's with coordination and implementation by the QAU. Annual training of the Field Research Directors, laboratory personnel and other support staff involved in the conduct of work is essential to the success of the IR-4 Project. GLP compliance audits of facilities and of ongoing field and laboratory procedures, provides assurance that IR-4 food safety data will be accepted by the crop protection industry, growers and the Agency. Without the existence of the IR-4 Project, fewer safe and effective crop protection chemicals and biological alternatives would be available for use on specialty crops today.

## **WORK PLANNED FOR 2004**

IR-4 will continue to seek input and technical guidance from all of its stakeholders, including state and federal agricultural scientists and state extension agents and specialists, commodity groups, growers, the crop protection industry, food processors, CDPR and the EPA to insure the program maintains its focus on important specialty crop needs. Established partnerships will be enhanced while new partnerships will be expanded with AAFC and PMRA.

The research program for year 2004 will consist of approximately 104 studies supported by 657 field trials. Ninety of these studies will require the collection of residue samples and 14 will be for collecting efficacy and/or crop safety data to support specific data needs. Four hundred and ninety-nine of the field trials (499) will be conducted by regional state agricultural research stations, while USDA-ARS will be conducting 106 field trials and Canada has agreed to cooperate on 52 trials. The program will be somewhat reduced from the 2003 program due to the budget reduction from Congress. However, the

program will still address the most important needs prioritized at the IR-4 2003 Food Use Workshop. As well, IR-4 will continue its efforts on the Crop Grouping Project. A Crop Group Working Group was formed by IR-4 and the EPA to prepare crop monographs and data packages in 2004 for the new crop grouping proposals starting with bulb vegetables and tropical fruit crops. As well, an International Crop Grouping Consulting Committee will be formed to assist this process.

IR-4 will continue its commitment to producing high quality, compliant scientific data in order to meet EPA's GLP requirements. IR-4 will continue to hold GLP and/or QA training sessions for IR-4 personnel and cooperators, audit data and reports, review and revise SOP's and strive to further enhance our effectiveness and efficiency.

The IR-4 QAU will meet on March 3-5, 2004 in Orlando, Florida to conduct the annual QA Planning Meeting. The implementation of the IR-4 30 month time-line for study completion and the EPA review plan will be the major focuses as QA assignments are planned for year 2004. Coordination of our field research monitoring season with our Canadian QA partners will be a productive addition to the QA work plan.

For the 2004 Biopesticide Research Program, IR-4 received 99 proposals requesting \$1,131,944. Out of the 99 proposals, 30 were early stage and 69 were advanced stage proposals. These included 63 proposals involving disease control, 23 for insect/mite control, 5 weed control, 7 nematode control, and 2 plant growth regulators. The proposals will be reviewed in January, approved by the PMC and the researchers will be notified in early March in time to conduct field trials.

In addition to the standard registered products, 1,3-dichloropropene, chloropicrin, and metam sodium, the experimental products that have shown various degrees of promise such as propylene oxide, MULTIGUARD™PROTECT, and SEP-100 will be evaluated in the IR-4 MBA program in 2004. In addition to these products, new products are to be included in the field programs. These products include seed treatment combinations to protect emerging seedlings from nematodes and fungal pathogens and a number of herbicides that can give selective weed control in mulched vegetables. The chemistries involved in the seed treatment products have not yet been disclosed. The herbicides include s-metolachlor and trifloxysulfuron sodium from Syngenta Crop Protection and sulfentrazone from FMC Corporation. The nematocide, fosthiazate, will also be included in trials where nematode pressures are anticipated. Trials in tomatoes, peppers and cucurbits are planned for AL, FL, MI, and NC in 2004. IR-4 is also supporting research in cut flowers in California through a competitive grants program to be administered jointly by IR-4 and the California Cut Flower Commission.

Ornamental protocols were developed for 79 chemicals and biopesticides. These included 36 herbicides, 25 fungicides, 16 insecticides, and 2 plant growth regulators. Approximately 600 IR-4 supported research trials are being scheduled to be conducted by federal, state, and private researchers across North America during 2004. A pilot program to investigate solutions to "Super A" project priorities identified at the 2003 Ornamental Workshop will be initiated. Researchers will be encouraged to focus on evaluating products to control *Phytophthora spp.*, scales/mealy bugs, and weeds in herbaceous perennial plants. A new clearance/registration accounting system will be implemented during 2004 and reports of clearances/registrations approved during this period and beyond will reflect those directly supported by IR-4 research data.

## **IMPACT**

The successes/accomplishments of the IR-4 Program have been documented by the food use and ornamental clearances obtained as noted in the Food Use New Tolerances and Approvals and Ornamental Pest Control Clearances sections, respectively. With the help of Hoyt Jamerson, EPA Minor Use Officer, IR-4 continued the Section 18 Economic Benefits Project initiated in 2000 to capture potential economic impact (loss) information from state submitted Section 18 approvals supported by IR-4 residue data. In 2003, the 2002 data were summarized and resulted in a \$1.3 billion impact with 134 Section 18's bringing the five year total to \$5.7 billion from 1998 to 2002. In the EPA's 2003 fiscal year (10/1/02 to 9/30/03),

IR-4 was credited with eliminating 95 of the 120 Section 18's or 80% by conversion to full Section 3 tolerances. This excellent accomplishment is a direct result of the 30-month completion goal and our partnership with the EPA and DPR. EPA also credited IR-4 in FY 2003 with 12 of the 26 reduced risk classifications granted by the Agency and lowering the Reduced Risk/OP Alternatives petition turnaround time from 28 months in FY2002 to 18 months in FY 2003.

Another way to measure the impact of IR-4 is to gauge it using an external yardstick. This was last accomplished in 1997 by a Review Team which was critical of the lack of new products for our specialty crop growers, the lengthy time to complete projects, and the status of EPA relations among over 50 recommendations for improvement. The 2003 Review Team was a blue ribbon panel assembled by Jim Parochetti, USDA-CSREES IR-4 National Program Leader, and was led by Charles Laughlin/retired USDA-CSREES Administrator and included Debbie Edwards/EPA Registration Division Director, Larry Chandler/USDA-ARS Northern Crop Science Lab Director, Steve Balling/Del Monte Research Director, Phil Hutton/BPPD Assistant Director, Janice McFarland/Syngenta Crop Protection North America Regulatory Head, and Lee Summers/Colorado State University Extension Director. The Review Team conducted a comprehensive program review at IR-4 Headquarters in NJ on May 19<sup>th</sup> to 22<sup>nd</sup> which included the Project Management Committee, Headquarters staff and Regional staff via teleconference. The following comments were taken from the Review Teams Report released in July 2003:

- IR-4 has demonstrated remarkable responsiveness to the prior review.
- Stakeholders are very supportive and laud IR-4 for its partnering skills.
- IR-4 is dedicated to its mission and is willing to go the extra mile to meet the needs of participants.
- EPA views IR-4 as a model for a cooperative partnership.
- IR-4 is committing to and meeting the 30 month timeline from project initiation to submission to the EPA.
- IR-4 has emphasized the registration of reduced risk chemistries.
- The number of pesticide registrations submitted to the EPA annually has increased dramatically over the past several years and reflects IR-4's commitment to "fill the tool box".

The concluding thoughts from the Review Team's Report were: The IR-4 Program is a very good program and is integral to the future of U.S. minor crops. The Review Team's findings and suggestions are offered with the goal of growing a very good program to a great program. Every indication is that IR-4 is on the right trajectory.

## **OVERALL SUMMARY**

2003 was the most productive year in IR-4's 40 year history due to the quality and dedication of the over 100 Team members who are focused on the mission of providing the latest crop protection technologies for U.S. specialty crop growers. The partnership between the USDA (ARS and CSREES) and the land grant university system is key to the program's success and is unique in the global world of minor crop agriculture. Other governments like Canada are using IR-4 as a model for their minor crop programs, while governments and farmers in European Union countries and Japan are studying how to implement similar programs. The partnerships developed by IR-4 with the crop protection industry (to make their latest chemical and biological pest control tools available to U.S. specialty crop growers) and with the regulatory agencies (EPA and CDPR) have worked well to the benefit of all parties involved, resulting in multiple win-win situations. The external Review Team's comments verified that the program is on track to continue to improve and make a very good program into a great program.

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IR-4, Cook College, Rutgers - The State University  
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Approved:

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R.M. Hollingworth, Chair, Project Management  
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G. Lemme, Chair, Administrative Advisers  
Michigan State University

Attachments:

1. Cooperating Personnel, Departments and Agencies
2. Field and Laboratory Research Cooperators
3. Food Use Research Projects
4. New Tolerances and Approvals
5. Crop Groups/Definitions
6. Data Packages Completed
7. Regulatory Documents in Preparation
8. Ornamentals Pest Control Registrations
9. Biopesticide Research and Development

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New Jersey Agricultural Experiment Station Publication No. P-27200-08-03, supported by State,  
U.S. Hatch Act and other U.S. Department of Agriculture funds

# **ATTACHMENT 1**

## **COOPERATING DEPARTMENTS AND AGENCIES**

Agriculture and Agri-Food Canada  
California Department of Pesticide Regulation  
Canadian Horticultural Council  
Canadian Pest Management Regulatory Agency  
U.S. Department of Agriculture, Agricultural Research Service  
U.S. Department of Agriculture, Animal and Plant Health Inspection Service  
U.S. Department of Agriculture, Cooperative State Research Education and Extension Service  
U.S. Department of Agriculture, Office of Pest Management Policy  
U.S. Environmental Protection Agency, Office of Prevention, Pesticides and Toxic Substances

## **PRINCIPAL LEADERS**

### **Administrative Advisers (AA's):**

Dr. M. Duryea, *University of Florida*  
Dr. C. Hefferan, *U.S. Department of Agriculture*  
Dr. E. Knipling, *U.S. Department of Agriculture*  
Dr. G. Lemme, *Michigan State University, Chair*  
Dr. M. Parrella, *University of California, Davis*  
Dr. D. Rossi, *Rutgers University*  
Dr. N. Thompson, *University of Florida (Jan-Jun)*

### **Representing**

Southern Region  
USDA-CSREES  
USDA-ARS  
Northcentral Region  
Western Region  
Northeast Region  
Southern Region

### **Project Management Committee (PMC):**

Dr. R. Hollingworth, *Michigan State University, Chair* Northcentral Region  
Dr. R. Holm, *Rutgers University, Executive Director* IR-4 Headquarters  
Dr. G. Lemme, *Michigan State University* AA Chair  
Mr. R. Lundy, *Mint Industry Research Council* CLC Chair  
Dr. M. Marshall, *University of Florida* Southern Region  
Dr. M. Miller, *University of California, Davis* Western Region  
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## **SUPPORT GROUPS**

### **Headquarters Technical and Support Staff:**

Dr. M. Arsenovic, *Coordinator*  
Mr. W. Barney, *Coordinator (Apr-Dec)*  
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Dr. H. Chen, *Coordinator*  
Dr. J. Corley, *Coordinator*  
Dr. K. Dorschner, *Coordinator*  
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Ms. J. Forder, *Project Associate (Sep-Dec)*  
Mr. R. Frank, *Manager, Ornamentals (Jan-Aug)*  
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Ms. K. Hackett-Fields, *QA Specialist*  
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## **ATTACHMENT 1 (Continued)**

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Mrs. S. Novack, *Communications & Publications Coordinator (Apr-Dec)*  
Dr. F. Salzman, *Coordinator*  
Mr. K. Samoil, *Coordinator*  
Mrs. K. Sims, *Administrative Assistant*  
Dr. V. Starner, *Coordinator*  
Dr. D. Thompson, *Coordinator*  
Mrs. J. Thompson, *Principal Clerk (Feb-Dec)*  
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Dr. S. Miyazaki, <i>Regional Field Coordinator</i>	Northcentral Region
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Dr. R. Leavitt, <i>Regional Laboratory Coordinator (Jan-Jun)</i>	Northcentral Region
Dr. Z. Chen, <i>Regional Quality Assurance Coordinator</i>	Northcentral Region
Ms. S. Perry, <i>Outreach Specialist (Jan-Apr)</i>	National
Dr. D. Soderlund, <i>Regional Director</i>	Northeast Region
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Dr. P. Larsson-Kovach, <i>Regional Laboratory Coordinator</i>	Northeast Region
Mrs. B. Anderson, <i>Regional Quality Assurance Coordinator</i>	Northeast Region
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Mr. S. Flanagan, <i>Regional Assistant Field Coordinator</i>	Western Region
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### **Consultants Committee:**

Ms. P. Cimino, *EPA-OPP, Minor Use Team Leader*  
Mr. G. Herndon, *EPA-OPP-HED*  
Mr. J. Holmdal, *CropLife America Representative*  
Mr. H. Jamerson, *EPA-OPP-RD, Minor Use Officer*  
Dr. B. Schneider, *EPA-OPP-HED*

### **Commodity Liaison Committee (CLC):**

Mr. M. Aerts, <i>Florida Fruit and Vegetable Association</i>	Orlando, FL
Dr. A. Bonanno, <i>Bonanno Farm Trust</i>	Methuen, MA
Dr. H. Ewart, <i>California Citrus Quality Council</i>	Auburn, CA
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Dr. B. Flood, <i>DelMonte Foods</i>	Rochelle, IL
Mrs. A. George, <i>Washington Hop Commission</i>	Moxee, WA
Mr. P. Korson, <i>Cherry Marketing Institute</i>	Lansing, MI
Mr. E. Kurtz, <i>EAK Ag., Inc.</i>	Salinas, CA
Mr. R. Lundy, <i>Mint Industry Research Council, CLC Chair</i>	Stevenson, WA
Mr. R. Olszack, <i>Tropical Fruit Growers of South Florida, Inc.</i>	Homestead, FL
Mr. R. Prewett, <i>Texas Vegetable Association</i>	Mission, TX
Mr. R. Ratto, <i>Ratto Brothers</i>	Modesto, CA
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Ms. L. Schmale, <i>Society of American Florists</i>	Alexandria, VA
Mr. D. Trinko, <i>MBG Marketing</i>	Grand Junction, MI

## **ATTACHMENT 1 (Continued)**

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Ms. M. Matthews FL  
Ms. P. Messick NC

#### **Northeastern Region**

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Ms. D. Johnston DE  
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#### **Western Region**

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Mr. J. McFarland CA  
Ms. D. Monter-Rodgers WA  
Ms. P. Yahata HI  
Consultant  
Ms. B. Glazier ID

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Dr. D. Doohan OH  
Dr. R. Hartzler IA  
Dr. S. Kamble NE  
Dr. M. Klein, USDA-ARS OH  
Dr. C. Krause, USDA-ARS OH  
Dr. C. Marr KS  
Dr. S. Miyazaki MI  
Dr. G. Smith MO  
Dr. D. Williams IL  
Dr. L. Wrage SD  
Dr. J. Wyman WI  
Dr. A. York IN  
Dr. R. Zollinger ND

#### **Northeast Region**

Dr. J. Allen DC  
Dr. R. Ashley CT  
Dr. F. Caruso MA  
Dr. R. Chandran WV  
Dr. G. Ghidui NJ  
Dr. G. Good NY  
Dr. A. Hazelrigg VT  
Dr. P. Heller PA  
Dr. J. Linduska MD  
Mr. W. Lord NH  
Ms. E. Lurvey NY  
Ms. E. Pfeil, USDA-ARS MD  
Mr. W. Smith NY  
Dr. D. Wallace RI  
Dr. R. Webb, USDA-ARS MD  
Dr. S. Whitney King DE  
Dr. D. Yarborough ME

## **ATTACHMENT 1 (Continued)**

### **State and Federal IR-4 Liaison Representatives (continued):**

#### **Southern Region**

Ms. N. Acin	PR
Dr. R. Bellinger	SC
Dr. C. Collison	MS
Dr. S. Culpepper	GA
Dr. R. Davis,	USDA-ARS GA
Mr. B. Fraelich,	USDA-ARS GA
Dr. M. Grodner	LA
Dr. H. Harrison,	USDA-ARS SC
Mr. T. Hendricks,	USDA-ARS GA
Dr. R. Holloway	TX
Dr. J. Kemble	AL
Dr. C. Meister	FL
Dr. W. Nesmith	KY
Dr. D. Monks	NC
Mr. C. Luper	OK
Dr. A. Simmons,	USDA-ARS SC
Dr. R. Talbert	AR
Dr. A. Thompson	TN
Dr. M. Weaver	VA
Vacant	VI

#### **Western Region**

Dr. R. Boydston,	USDA-ARS WA
Dr. D. Carling	AK
Mr. J. Davison	NV
Dr. H. Deer	UT
Dr. M. Ferrell	WY
Dr. R. Hirnyck	ID
Dr. J. Jenkins	OR
Dr. P. Landolt,	USDA-ARS WA
Dr. M. Kawate	HI
Dr. R. Linderman,	USDA-ARS OR
Dr. S. McDonald	CO
Dr. R. Miller	GU
Dr. J. Palumbo	AZ
Dr. R. Petroff	MT
Dr. M. Renz	NM
Ms. R. Sisco	CA
Dr. D. Walsh	WA
Mr. T. Wixson,	USDA-ARS WA

## ATTACHMENT 2

### FIELD AND LABORATORY RESEARCH COOPERATORS - 2003

The IR-4 Project is grateful to the many agricultural scientists who participated in the field and laboratory research phases of the program in 2003. Although their efforts frequently are unrecognized, their cooperation is the essential element in producing the data, field residue samples and laboratory analyses which meet EPA data requirements and conform to Good Laboratory Practice Standards. The continuing association with the minor use program of many state and federal scientists not only enhances the quality of the data but adds credibility that the objectives of the program are being met.

#### NORTHCENTRAL REGION

Dr. J. Baldock	WI	Dr. R. Leavitt	MI
Mr. M. Ciernia	ND	Mr. C. Lee	ND
Dr. S. Clay	SD	Dr. R. Wilson	NE
Dr. J. Fleeker	ND	Mr. J. Wise	MI
Mr. D. Heider	WI	Dr. J. Wyman	WI
Dr. C. Hoy	OH	Dr. B. Zandstra	MI
Mr. B. Jenks	ND		

#### NORTHEAST REGION

Dr. R. Bellinder	NY	Dr. P. Larsson-Kovach	NY
Dr. F. Drummond	ME	Ms. M. Ross	MD
Ms. E. Hitchner	NJ	Dr. D. Yarborough	ME

#### SOUTHERN REGION

Mr. R. Batts	NC	Mr. W. Shamiyeh	TN
Dr. J. Crane	FL	Mr. B. Smith	TN
Ms. L. Gregg	TX	Dr. W. Stall	FL
Dr. R. Johnson	FL	Ms. J. Yoh	FL

#### WESTERN REGION

Dr. D. Anderson	OR	Dr. Q. Li	HI
Dr. M. Bari	CA	Mr. S. Mangini	CA
Mr. B. Boutwell	CA	Mr. W. Meeks	ID
Mr. D. Cervantes	ID	Mr. M. Miller	CA
Mr. C. Cornwell	OR	Mr. T. Miller	WA
Mr. M. Craig	NM	Ms. M. Mitchell	CA
Mr. J. DeFrancesco	OR	Mr. C. Oman	CO
Mr. D. Ennes	CA	Mr. J. Roncoroni	CA
Mr. C. Farrar	CA	Mr. S. Scheufele	CA
Mr. K. Hembree	CA	Mr. M. Straugh	CA
Dr. M. Hengel	CA	Dr. D. Stoffel	CA
Dr. M. Kawate	HI	Mr. R. Wight	WA
Ms. G. Koskela	OR		

## **Attachment 2 (Continued)**

### **USDA-ARS**

Ms. S. Benzen	CA	Ms. E. Pfeil	MD
Mr. B. Fraelich	GA	Dr. A. Simmons	SC
Ms. M. Giovannini	OH	Mr. T. Treat	WA
Mr. T. Hendricks	GA	Mr. T. Wixson	WA
Mr. D. McCommas	TX		

### **CANADA**

Mr. K. Ardiel	ON	Ms. C. Harms	AB
Ms. C. Bastiani	QC	Mr. S. Howatt	PE
Ms. S. Bouffard	QC	Mr. J. Jotaham	NS
Ms. V. Brookes	BC	Mr. G. O'Neill	ON
Dr. A. Hamill	ON	Mr. F. Vaughn	ON

## **2003 IR-4 Ornamental Researchers**

### **NORTHCENTRAL REGION**

B.A. Anderson	OH, USDA-ARS
R.A. Cloyd	IL
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M.K. Hausbeck	MI
C.R. Krause	OH, USDA-ARS
H.M. Mathers	OH
D.G. Nielsen	OH
D.R. Smitley	MI

### **NORTHEAST REGION**

J.F. Ahrens	CT
C.E. Beste	MD
L. Englander	RI
R.A. Garrett	MD
S. Gill	MD
S.E. Hart	NJ
E.M. Hitchner	NJ
J.C. Locke	MD, USDA-ARS
T.L. Mervosh	CT
G.L. Rossell	NJ
J.C. Sellmer	PA
A.F. Senesac	NY

### **SOUTHERN REGION**

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D.M. Benson	NC
M.A. Czarnota	GA
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D.C. Fare	TN, USDA-ARS
B.A. Fraelich	GA, USDA-ARS
C.H. Gilliam	AL
L.L. Gregg	TX
G.J. Keever	AL
P.R. Knight	MS
S. Ludwig	TX
J.C. Neal	NC
J.G. Norcini	FL
P.B. Schultz	VA
A.M. Simmons	SC, USDA-ARS
R.E. Talbert	AR
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### **WESTERN REGION**

J. Altland	OR
G.A. Chastagner	WA
C.L. Elmore	CA
J.E. Klett	CO
R.C. Lambe	WA
H. Leith	CA
R.G. Linderman	OR, USDA-ARS
S.A. Tjosvold	CA
T.L. Treat	WA, USDA-ARS

## ATTACHMENT 3

### Food Use Research Projects - 2003

#### Residue Trials

<b>CHEMICAL</b>	<b>COMMODITY</b>	<b>PR #</b>	<b>CHEMICAL</b>	<b>COMMODITY</b>	<b>PR #</b>
• Acequinocyl	Pepper (Bell & Non-Bell)	8605	• Fluazinam	Bean (Dry)	6369
• Acequinocyl	Tomato (Field & GH)	8356	• Fluazinam	Bean (Lima)	8798
• Azoxystrobin	Safflower	8656	• Fluazinam	Bean (Snap)	7602
• Bifenazate	Bean (Succulent Shelled & Edible)	A8275	• Fluazinam	Blueberry	6129
• Bifenazate	Papaya	8270	• Fluazinam	Cabbage	8796
• Bifenthrin	Radish	8304	• Fluazinam	Ginseng	8791
• Boscalid + Pyraclostrobin	Basil	8792	• Fluazinam	Greens (Mustard)	8797
• Boscalid + Pyraclostrobin	Chives	8793	• Flufenacet	Bean (Snap)	8070
• Boscalid + Pyraclostrobin	Dill	8691	• Flumioxazin	Asparagus	8059
• Boscalid + Pyraclostrobin	Endive (Belgian)	8662	• Flumioxazin	Blueberry	8331
• Boscalid + Pyraclostrobin	Tomato (GH)	8374	• Flumioxazin	Cantaloup	8316
• Buprofezin	Cherry	7250	• Flumioxazin	Pecan	8818
• Buprofezin	Guava	7403	• Flumioxazin	Pepper (Bell & Non-Bell)	8321
• Buprofezin	Strawberry	8737	• Flumioxazin	Tomato	8320
• Clethodim	Safflower	8591	• Flumioxazin	Pea (Succulent)	7286
• Clomazone	Rhubarb	8724	• Halosulfuron	Potato	8829
• Cyprodinil + Fludioxonil	Avocado	7338	• Hexythiazox	Caneberry	8257
• Cyprodinil + Fludioxonil	Parsley	7130	• Imidacloprid	Blueberry	7038
• DCPA	Carrot	8332	• Indoxacarb	Cantaloup	8339
• Diflubenzuron	Barley, Wheat	8024	• Indoxacarb	Cherry	7235
• Dimethenamid-P	Hops	8705	• Indoxacarb	Cranberry	8127
• Dimethomorph	Bean (Lima)	7261	• Indoxacarb	Peach	7228
• Dinotefuran	Greens (Mustard)	8626	• Indoxacarb	Plum	7234
• Etoxazole	Mint	8816	• Indoxacarb	Squash (Summer)	8340
• Famoxadone + Cymoxanil	Caneberry	8766	• Indoxacarb	Asparagus (Fern)	8742
• Famoxadone + Cymoxanil	Spinach	8308	• Lambda- Cyhalothrin	Kiwifruit	B3050
• Fenamidone	Carrot	8524	• Mefenoxam	Blueberry (Highbush)	7671
• Fenhexamid	Asparagus	8692	• Methoxyfenozide	Grasses	7524
• Fenhexamid	Caneberry (Raspberry)	A6840	• Methoxyfenozide	Peanut	8115
• Fenpropathrin	Avocado	7861	• Methoxyfenozide	Sweetpotato	8505
• Fenpropathrin	Barley	7667	• Milbemectin	Eggplant	8398
• Fipronil	Carrot	6887	• Oxyfluorfen	Artichoke	7579
• Fipronil	Radish	6888	• Oxyfluorfen	Cucumber	A3711
• Flonicamid	Carrot	8754	• Oxyfluorfen	Eggplant	A4134
• Flonicamid	Hops	8706	• Oxyfluorfen	Pepper (Bell & Non-Bell)	A4133
• Flonicamid	Radish	8753	• Oxyfluorfen	Squash (Summer)	A3712
			• Prometryn	Celeriac	3567
			• Prometryn	Okra	8575
			• Pronamide	Lettuce (Leaf)	8709
			• Quinoxifen	Peach	8462
			• Quinoxifen	Plum	8463
			• Quinoxifen	Squash (Winter)	7653
			• S-Metolachlor	Cantaloup	A6178
			• S-Metolachlor	Squash (Winter)	6630



## **ATTACHMENT 3 (continued)**

### **Residue Trials (continued)**

• Spinosad	Almond	8739	• Thiophanate Methyl	Greens (Mustard)	8468
• Spinosad	Dill (Seed)	A7361	• Thiophanate Methyl	Tomato (Field & GH)	8506
• Spinosad	Pineapple	8693	• Thymol + Eucalyptol + Camphor	Honey & Beeswax	8661
• Sulfentrazone	Pea (Succulent)	6520	• Trifloxystrobin	Papaya	7973
• Sulfentrazone	Strawberry	7044	• Zeta-Cypermethrin	Safflower	8677
• Sulfentrazone	Wheat	8722			
• Thiachloprid	Blueberry	7813			
• Thiophanate Methyl	Citrus	8294			
• Thiophanate Methyl	Ginseng	6546			

### **Performance Trials**

• Azoxystrobin	Broccoli	7096	• Dimethomorph	Onion (Dry Bulb)	7200
• Boscalid + Pyraclostrobin	Apple	8808	• Dimethomorph	Pepper (Bell & Non-Bell)	6750
• Boscalid + Pyraclostrobin	Apple (PH)	8890	• Fludioxonil	Asparagus	7257
• Boscalid + Pyraclostrobin	Cantaloup	8835	• Pyraclostrobin	Broccoli	7493
• Boscalid + Pyraclostrobin	Celeriac	8362	• Pyraclostrobin	Cabbage	7494
• Boscalid + Pyraclostrobin	Celeriac	8362	• Pyraclostrobin	Celeriac	8888
• Boscalid + Pyraclostrobin	Cranberry	8902	• Pyraclostrobin	Greens (Mustard)	7595
• Boscalid + Pyraclostrobin	Cranberry	8902	• Pyraclostrobin	Lettuce (Head & Leaf)	7640
• Boscalid + Pyraclostrobin	Endive (Belgian)	8662	• Pyraclostrobin	Mint	8513
• Boscalid + Pyraclostrobin	Endive (Belgian)	8662	• Pyraclostrobin	Parsley	8887
• Boscalid + Pyraclostrobin	Greens (Mustard)	8094	• Pyraclostrobin	Pea (Succulent)	8785
• Boscalid + Pyraclostrobin	Greens (Mustard)	8094	• Pyraclostrobin	Turnip Greens	7594
• Boscalid + Pyraclostrobin	Hops	8889	• Spinosad	Almond	8739
• Boscalid + Pyraclostrobin	Hops	8889	• Spinosad	Dill (Seed)	A7361
• Boscalid + Pyraclostrobin	Onion (Green & Dry Bulb)	7920	• Spinosad	Pineapple	8693
• Boscalid + Pyraclostrobin	Onion (Green & Dry Bulb)	7920	• Sulfentrazone	Pea (Succulent)	6520
• Boscalid + Pyraclostrobin	Stone Fruits	7921	• Sulfentrazone	Strawberry	7044
• Boscalid + Pyraclostrobin	Stone Fruits	7921	• Sulfentrazone	Wheat	8722
• Boscalid + Pyraclostrobin	Stone Fruits (PH)	7922	• Thiachloprid	Blueberry	7813
• Boscalid + Pyraclostrobin	Stone Fruits (PH)	7922	• Thiophanate Methyl	Citrus	8294
• Boscalid + Pyraclostrobin	Strawberry	7929	• Thiophanate Methyl	Ginseng	6546
• Boscalid + Pyraclostrobin	Strawberry	7929	• Thiophanate Methyl	Greens (Mustard)	8468
• Boscalid + Pyraclostrobin	Turnip (Roots & Tops)	7927	• Thiophanate Methyl	Tomato (Field & GH)	8506
• Cyprodinil + Fludioxonil	Parsley	7130	• Thymol + Eucalyptol + Camphor	Honey & Beeswax	8661
• Dimethomorph	Broccoli	7199	• Trifloxystrobin	Papaya	7973
• Dimethomorph	Cabbage	7248	• Zeta-Cypermethrin	Safflower	8677
• Dimethomorph	Cantaloup	6753			
• Dimethomorph	Cucumber	6754			
• Dimethomorph	Lettuce (Head)	7021			

## ATTACHMENT 4

### New Tolerances and Approvals - 2003

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
<b>Fungicide</b>					
	<i>Aspergillus flavus AF36</i>				
		Cotton	52B	1	1
<b>Herbicide</b>					
	<i>Imazamox</i>				
		All RAC's	7219	10	1
<b><u>Exemption/TLT</u></b>					
<b>Insecticide</b>					
	<i>Thymol</i>				
		Beehives	160B	1	1
<b><u>Permanent</u></b>					
<b>Fungicide</b>					
	<i>Azoxystrobin</i>				
		Artichoke	7364	1	1
		Asparagus	7033	1	1
		Basil (Herbs)	7104	42	1
		Broccoli	7096	1	1
		Cabbage (Brassica Crops)	7095	11	
	<i>Cymoxanil</i>				
		Hops	6941	1	1
	<i>Cyprodinil</i>				
		Caneberry subgroup	6838	4	1
		Pistachio	7336	1	1
		Watercress	6759	1	1
	<i>Cyprodinil + Fludioxonil</i>				
		Basil (Herbs)	7123	43	2
		Blueberry (Bushberry)	6724	10	2
		Broccoli (Brassica (Crops)	7122	11	1
		Cabbage	7121	1	1
		Carrot	7090	2	2
		Chives (Herbs)	7126	43	2
		Green (Mustard) (Leafy Brassica Crops)	7622	14	2
		Tropical Fruit	7760	10	10

# ATTACHMENT 4 (Continued)

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
<b><u>Permanent (continued)</u></b>					
<i>Dimethomorph</i>					
	Greens (mustard)		7247	7	1
	(Leafy Brassica Crops)				
	Pepper (all)		6750	8	1
	Taro		7335	2	2
<i>Fenhexamid</i>					
	Cherry		6937	2	1
	Cucumber (Greenhouse)		7853	1	1
	Kiwi		7600	1	1
	Lettuce (Greenhouse)		7854	19	
	Also GH Transplant				
	Peach (Stone Fruit)		6936	4	1
	Pepper		7264	3	1
	Plum		7318	2	1
	Tomato (Fruit Vegetables)		7251	5	1
	Tomato/Pepper (Greenhouse)		7896	1	
<i>Fosetyl-Al</i>					
	Green onion			1	1
<i>Quinoxyfen</i>					
	Cherry		7757	1	1
	Grape		7256	1	1
	Hops		7350	1	1
<i>Spiroxamine</i>					
	Hops		6946		
<i>Trifloxystrobin</i>					
	Carrot (Root Crops)		7045	15	1
	Celery (Petiole Crops)		7046	6	1
<b>Herbicide</b>					
<i>Mesotrione</i>					
	Popcorn			1	1
<i>Sethoxydim</i>					
	Pistachio		3707	1	1
	Safflower		2531	1	1
<i>S-Metolachlor</i>					
	Asparagus		1908	1	1
	Carrot (muck)		2154	1	1
	Chard, Swiss		6391	1	1
	Grass (seed) (Bulb Vegetables)		6345	16	3

## ATTACHMENT 4 (Continued)

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
<b><u>Permanent (continued)</u></b>					
<i>S-Metolachlor (continued)</i>					
	Onion (green)		6717	6	1
	Rhubarb		6666	1	1
	Spinach		1217	1	1
	Tomato		2000	1	1
<i>Sulfentrazone</i>					
	Asparagus		6661	1	1
	Bean (lima)		7583	1	1
	Cabbage		6522	1	1
	Horseradish		6745	1	1
	Mint		6343	2	2
	Potato		7723	1	1
	Sunflower		6911	1	1
<b>Insecticide</b>					
<i>Bifenazate</i>					
	Almond (Tree Nuts)		7904	10	1
	Cantaloup (Melons)		7510	4	1
	Cucumber (Cucurbits)		7511	5	1
	Mint		7386	1	2
	Okra		8694	1	1
	Pepper		7552	3	
	Pistachio		7974	1	1
	Squash		7512	6	
	Tomato (Fruiting Vegetables)		7266	6	1
<i>Bifenthrin</i>					
	Basil (Greenhouse)		6642	1	
	Celery		4945	6	
	Chives (Greenhouse)		6641	1	
	Greens (mustard)		6970	1	1
	Herbs (Greenhouse)		6643	41	1
	Okra		8080	1	1
	Spinach (Leafy Vegetables)		7088	17	
	Tomato (Fruiting Vegetables)		4153	8	1
	Tomato (Greenhouse)		A4868	1	
<i>Buprofezin</i>					
	Avocado		7740	1	1
	Bean (succulent)		7660	14	1
	Lime		6974	1	1

## ATTACHMENT 4 (Continued)

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
			<b><u>Permanent (continued)</u></b>		
	<i>Buprofezin (continued)</i>				
	Lychee		7739	1	1
	Pistachio		6832	1	1
	<i>Cyromazine</i>				
	Bean (lima)		A3908	1	1
	Broccoli (Brassica Crops)		8359	5	
	Cabbage (Brassica Crops)		8457	6	1
	Cauliflower		8360	1	
	Mustard Greens (Leafy Brassica Crops)		8458	8	1
	Onion (dry bulb)		7239	6	1
	Onion (green)		7238	5	1
	<i>Fenpyroximate</i>				
	Pear		8346		
	<i>Hexythiazox</i>				
	Date			1	1
	<i>Imidacloprid</i>				
	Artichoke		6622	1	1
	Artichoke		7358	1	
	Avocado		7099	6	1
	Beans, Dry		6528	20	1
	Beet, garden (Root Crops)		6305	14	
	Blueberry		6817	4	1
	Carrot (Root Crops)		6307	15	1
	Cherry (Stone Fruit)		7202	2	1
	Cranberry		5745	1	
	Guava		7738	6	1
	Mamey Sapote		6450	1	1
	Okra		6588	1	1
	Papaya		7351	1	1
	Passion Fruit		6449	1	1
	Pea		6398	17	
	Peach (Stone Fruit)		6399	4	
	Plum (Stone Fruit)		7279	2	
	Popcorn		8464	1	1
	Radish		6308	1	
	Southern Pea		6498	1	
	Strawberry		6260	1	1

## ATTACHMENT 4 (Continued)

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
			<b><u>Permanent (continued)</u></b>		
			<i>Imidacloprid (Continued)</i>		
		Tomato (Greenhouse)	7099	1	
		Turnip roots	6306	1	
		Turnip tops	7802	1	1
		Watercress	6501	1	1
			<i>Methoxyfenozide</i>		
		Cantaloup (Melon)	7195	5	1
		Cranberry	7355	1	1
		Cucumber (Cucurbits)	7016	4	
		Okra		1	1
		Pea (blackeyed)	7018	1	1
		Squash (summer) (Cucurbits)	7194	6	1
		Turnip (tops)	7438	1	1
			<i>Pyriproxyfen</i>		
		Avocado (Tropical Fruit)	8135	8	1
		Fig	8258	1	1
		Okra	7414	1	1
		Sugar Apple (Tropical Fruit)	A7010	7	1
			<i>Thiamethoxam</i>		
		Bean (succulent)	7589	1	1
		Cherry (Stone Fruit)	7673	2	1
		Peach (Stone Fruit)	7052	4	1
		Plum (Stone Fruit)	7674	2	1
		Sunflower	8465	1	1
<b>Rodenticide</b>					
			<i>Zinc Phosphide</i>		
		Alfalfa	6632	1	1
		Barley	6626	1	1
		Bean	2126	12	1
		Beet (sugar)	3951	1	1
		Grass (Timothy)	6632	22	1
		Potato	6123	4	1
		Wheat	2440	1	1

## ATTACHMENT 4 (Continued)

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
			<u>TLT</u>		
<b>Fungicide</b>					
	<i>Fludioxonil</i>				
		Pomegranate	8085	1	1
	<i>Mancozeb</i>				
		Ginseng	992	1	1
	<i>Myclobutanil</i>				
		Hops	6939	1	1
		Pepper, non-bell	6071, 6070	2	2
	<i>Propiconazole</i>				
		Bean, dry	2008	1	1
		Cranberry	6320	1	1
	<i>Sodium Chlorate</i>				
		Wheat	1166	1	1
	<i>Tebuconazole</i>				
		Barley	6513	1	1
		Garlic	7197	1	1
	<i>Thiophanate-methyl</i>				
		Fruiting Vegetables	8614, 8506	4	1
		Mushrooms	8289	1	1
	<i>Vinclozolin</i>				
		Canola	5159	1	1
<b>Herbicide</b>					
	<i>2,4-D</i>				
		Wild Rice	1015	1	1
	<i>Carfentrazone</i>				
		Hops	7596	1	1
	<i>Desmedipham</i>				
		Beet, garden	337	1	1
	<i>Flumioxazin</i>				
		Sweetpotato	8710	1	1
	<i>S-Metolachlor</i>				
		Sweetpotato	5413	1	1
	<i>Terbacil</i>				
		Watermelon	2841	1	1

## ATTACHMENT 4 (Continued)

<i>Product Type</i>	<i>Product</i>	<i>Crop</i>	<u>Approval Type</u> <i>PR#</i>	<i>No. Uses</i>	<i>Tolerances</i>
			<u>TLT (continued)</u>		
<b>Insecticide</b>					
	<i>Bifenthrin</i>				
		Citrus	7085, 7086	14	1
	<i>Diflubenzuron</i>				
		Wheat/Barley	8024	2	2
	<i>Hydramethylnon</i>				
		Pineapple	1756	1	1
	<i>Indoxacarb</i>				
		Peach	7228	2	1
	<i>Lambda-cyhalothrin</i>				
		Barley	6400	1	1
		Wild Rice	8850	1	1
	<i>Pyriproxyfen</i>				
		Beans	8130, 8802	33	1
	<i>Spinosad</i>				
		Alfalfa	7889	1	1
		All RACs	8095	Many	1
		Onion, dry bulb (Bulb Vegetables Dry)	6651	3	1
	<i>Tebufozide</i>				
		Garden beet	8387	1	1
		Sweet potato	6512	1	1
	<i>Thiamethoxam</i>				
		Bean, dry	7675	21	1
		Hops	8451	1	1



## **Attachment 5**

### **Crop Grouping Statistics: Current vs. Proposed Changes from the International Crop Grouping Symposium**

<b>Proposals</b>	<b>Existing Status</b>	<b>New Proposals</b>	<b>Total</b>	<b>Increased</b>
Commodities	508	553	1061	> 2 fold
Crop Groups	19*	19	38	2 fold
Subgroups	18	72	90	4 fold
Definitions	20	29	49	> 2 fold
Ornamentals	0	900	900	New
Ornamental Groups	0	12	12	New

\* The Oilseed Crop Group has been approved by ChemSAC, but has not yet been published in the Federal Register.

## Attachment 6

### Data Packages Completed in 2003

<i>Tolerance Amendment</i>	<i>Product</i>	<i>Crop</i>	<i>PR Number</i>
	<i>Aspergillus flavus</i> AF36	Cotton	52B
	Bifenthrin	Soybean	8851
	Chlorpyrifos	Apple	8015
	Dicofol	Caneberry	4102/4103
	Diuron	Peach	7962
	Fludioxonil	Apple (Postharvest)	7568
	Fludioxonil	Cantaloup	7618
	Fludioxonil	Pear	7569
	Metribuzin	Garlic	6386
	Myclobutanil	Caneberry	A5058
	Myclobutanil	Currant	A5309
	Myclobutanil	Gooseberry	A5308
	Myclobutanil	Mayhaw	5737
	Myclobutanil	Papaya	7744
	Oxyfluorfen	Safflower	5454
	Paraquat	Balsam Pear	3069
	Paraquat	Calabaza	3926
	Paraquat	Cantaloup	1476
	Paraquat	Cucumber	2978
	Paraquat	Gourds, Edible	3070
	Paraquat	Pumpkin	2985
	Paraquat	Squash (summer)	2982
	Paraquat	Squash (winter)	6503
	Spinosad	Nectarine	7580
<i>New</i>	Abamectin	Basil	6755
	Azoxystrobin	Dill	7363
	Azoxystrobin	Safflower	8656
	Azoxystrobin	Sunflower	7258
	Bifenazate	Cherry	7054
	Bifenthrin	Okra	8080
	Boscalid + Pyraclostrobin	Celery	8091
	Boscalid + Pyraclostrobin	Spinach	8090
	Buprofezin	Avocado	7740
	Buprofezin	Guava	7403
	Buprofezin	Passion Fruit	6977

## Attachment 6 (Continued)

<i>Tolerance</i>	<i>Product</i>	<i>Crop</i>	<i>PR Number</i>
	Buprofezin	Peach	7517
	Buprofezin	Pear	7518
	Buprofezin	Sugar Apple	6879
	Carfentrazone	Hops	7596
	Carfentrazone	Super crop group	8510, 8511, 8530, 8531, 8562, 8478, 7972, 8632
	Carfentrazone	Super crop group	8650, 7445, 8649, 8559, 8518, 8805, 7163, 8512
	Carfentrazone	Super crop group	8630, 8631, 8591, 8520, 8517, 8529, 8648, 8650
	Carfentrazone	Super crop group	8906
	Carfentrazone	Tropical tree fruit	8472
	Clethodim	Flax	7558
	Cyfluthrin	Grass	6837
	Cyfluthrin	Turnip Greens	7562
	Cyprodinil + Fludioxonil	Bean (Dry)	7782
	Cyprodinil + Fludioxonil	Bean (Lima)	7783
	Cyprodinil + Fludioxonil	Bean (Snap)	7614
	Cyprodinil + Fludioxonil	Lettuce	7131
	Dimethomorph	Greens (mustard)	7247
	Dimethomorph	Taro	7335
	Ethofumesate	Beet, garden	742
	Ethofumesate	Carrot	6703
	Fenhexamid	Apple	7601
	Fenhexamid	Pear	7402
	Fenpropathrin	Blueberry	7815
	Fenpropathrin	Currant	6739
	Fludioxonil	Citrus (Postharvest)	7947
	Fludioxonil	Kiwi (Postharvest)	7639
	Fludioxonil	Mustard Seed/Rape	
	Fludioxonil	Yam	8107
	Flumioxazin	Mint	8075
	Flumioxazin	Onion (dry bulb)	7389
	Flumioxazin	Potato	7964
	Fluroxypyr	Onion (dry bulb)	7705
	Imidacloprid	Atemoya	7098

## Attachment 6 (Continued)

<i>Tolerance</i>	<i>Product</i>	<i>Crop</i>	<i>PR Number</i>
	Imidacloprid	Coffee	5760
	Imidacloprid	Coffee	6928/5760
	Imidacloprid	Soursop	7100
	Imidacloprid	Sugar apple	6993
	Imidacloprid	Sunflower	8811
	Indoxacarb	Collard	6986
	Lambda-cyhalothrin	Barley/Wild Rice	6400/8850
	Metaldehyde	Artichoke	7396
	Methoxyfenozide	Bean (snap)	7532
	Methoxyfenozide	Bean (succulent)	7531
	Methoxyfenozide	Beet (sugar)	7522
	Methoxyfenozide	Carrot	7520
	Methoxyfenozide	Celeriac	8027
	Methoxyfenozide	Cilantro	8389
	Methoxyfenozide	Dill	7533
	Methoxyfenozide	Garden beet	8871
	Methoxyfenozide	Mango	7062
	Methoxyfenozide	Mint	7755
	Methoxyfenozide	Papaya	7063
	Methoxyfenozide	Pea (podded)	7529
	Methoxyfenozide	Pea (succulent)	7528
	Methoxyfenozide	Radish	7521
	Methoxyfenozide	Sapodilla	8615
	Methoxyfenozide	Strawberry	6768
	Paraquat	Ginger	7824
	Pyraclostrobin	Broccoli	7493
	Pyraclostrobin	Cabbage	7494
	Pyraclostrobin	Turnip Greens	7594
	Pyridalyl	Mustard Greens	8594
	Pyridalyl	Tomato	8745
	Pyriproxyfen	Bean (lima)	8802
	Pyriproxyfen	Bean (snap)	8130
	Pyriproxyfen	Onion(dry bulb)	7886
	Pyriproxyfen	Pea (southern)	7179
	Pyriproxyfen	White Sapote et. al.	5103
	Quinoxifen	Pepper	8006
	<i>Reynoutria sachalinensis</i>	All RAC's	42B
	S-Metolachlor	Bulb Vegetables	5396
	S-Metolachlor	Caneberry	3497

## Attachment 6 (Continued)

<i>Tolerance</i>	<i>Product</i>	<i>Crop</i>	<i>PR Number</i>
	S-Metolachlor	Carrot (muck)	2154
	S-Metolachlor	Chard, Swiss	6391
	S-Metolachlor	Fruiting Vegetables	
	S-Metolachlor	Grass (seed)	6345
	S-Metolachlor	Horseradish	6470
	S-Metolachlor	Onion (green)	6717
	S-Metolachlor	Peppers (all)	2986
	S-Metolachlor	Rhubarb	6666
	S-Metolachlor	Root Vegetables	6899
	Spinosad	Alfalfa	7889
	Spinosad	All RACs	8095
	Spinosad	Banana	7332
	Spinosad	Grasses	8040
	Spinosad	Leek	8393
	Spinosad	Mint	7347
	Spinosad	Onion (Green)	6652
	Spinosad	Onion dry bulb	6651
	Terbicil	Watermelon	2841
	Thiamethoxam	Bean (dry)	7675
	Thiamethoxam	Blueberry	7051
	Thiamethoxam	Cranberry	7754
	Thiamethoxam	Mint	7362
	Thiamethoxam	Mustard Seed/Rape (oilseed crops)	8893
	Thiamethoxam	Pea (dry)	7590
	Thiamethoxam	Pea (succulent)	7676
	Thiamethoxam	Soybean	7590
	Thiamethoxam	Strawberry	7989
	Trifloxystrobin	Barley	8892
	Zeta-cypermethrin	Cilantro	8390
	Zeta-cypermethrin	Turnip greens	7548

## ATTACHMENT 7

### Regulatory Documents in Preparation

<b>CHEMICAL</b>	<b>COMMODITY</b>	<b>PR#</b>	<b>CHEMICAL</b>	<b>COMMODITY</b>	<b>PR#</b>
• 2,4-D	Potato	1029	• Cyprodinil + Fludioxonil	Strawberry	6790
• Abamectin	Bean (Dry)	5001	• Cyromazine	Bean (Snap)	3909
• Abamectin	Bean (Lima)	7271	• Deltamethrin	Beet (Garden)	337
• Abamectin	Bean (Snap)	5478	• Difenoconazole	Sweetpotato	8364
• Abamectin	Chives	7102	• Difenoconazole	Yam	6958
• Abamectin	Guava	6435	• Diflubenzuron	Greens (Mustard)	8031
• Abamectin	Lychee	7831	• Diflubenzuron	Peanut	7737
• Abamectin	Onion (Dry Bulb)	7237	• Dimethenamid-P	Radish	7695
• Abamectin	Onion (Green)	4068	• Dimethenamid-P	Turnip	7696
• Abamectin	Papaya	4078	• Emamectin	Cucumber	6987
• Acifluorfen	Bean (Lima)	6300	• Esfenvalerate	Passion Fruit	3694
• AVG	Cherry	8052	• Ethofumesate	Onion (Dry Bulb)	5398
• AVG	Peach	8053	• Ethoprop	Pepper	5323
• AVG	Plum	8054	• Famoxadone + Cymoxanil	Hops	7796
• Azoxystrobin	Citrus	7593	• Fenamidone	Sunflower	7999
• Azoxystrobin	Parsley	7111	• Fenarimol	Hops	6940
• Azoxystrobin	Safflower	8656	• Fenbuconazole	Pepper	6372
• Bifenazate	Pea (Succulent)	8276	• Fenpyroximate	Hops	8087
• Bifenazate	Potato	8278	• Fenpyroximate	Mint	8452
• Bifenthrin	Beet (Garden)	7556	• Ferbam	Caneberry	4981
• Bifenthrin	Carrot	7089	• Ferbam	Cherry	4085
• Bifenthrin	Cilantro	7557	• Fipronil	Plantain	6712
• Bifenthrin	Mayhaw	7513	• Fludioxonil	Pomegranate	8085
• Boscalid +	Avocado	8446	• Flumioxazin	Garlic	8055
• Buprofezin	Papaya	7024	• Flumioxazin	Strawberry	8063
• Buprofezin	Plum	7519	• Fluroxypyr	Apple	7706
• Captan	Lettuce (Leaf)	8447	• Fluroxypyr	Pear	7707
• Captan	Tomato	8448	• Glufosinate	Blueberry	5291
• Chlorimuron- ethyl	Cranberry	3023	• Glufosinate	Corn (Sweet)	6953
• Chlorothalonil	Horseradish	2392	• Glufosinate	Corn (Sweet)	6515
• Chlorothalonil	Pepper (Bell)	32	• Glyphosate	Flax	6156
• Chlorothalonil	Pepper (Non-Bell)	571	• Glyphosate	Pea (Dry)	6139
• Chlorothalonil	Persimmon	5388	• Glyphosate	Safflower	6162
• Chlorothalonil	Rhubarb	5410	• Glyphosate	Strawberry	1409
• Clethodim	Asparagus	5427	• Imidacloprid	Banana	7333
• Clethodim	Basil	5759	• Imidacloprid	Chives	6259
• Clethodim	Bean (Lima)	5206	• Imidacloprid	Coffee	6928
• Clethodim	Bean (Snap)	5205	• Imidacloprid	Hops	6525
• Clethodim	Caneberry	6060	• Imidacloprid	Pomegranate	8254
• Clethodim	Chives	6246	• Indoxacarb	Cranberry	8127
• Clethodim	Hops	8086	• Indoxacarb	Cucumber	6985
• Clethodim	Lettuce (Head)	7694	• Indoxacarb	Mint	8418
• Clethodim	Sesame	7756	• Indoxacarb	Pea (Southern)	6984
• Clomazone	Broccoli	3569	• Linuron	Celeriac	3557
• Clopyralid	Blueberry	5433	• Linuron	Celery	4936
• Clopyralid	Flax	7223	• Linuron	Coriander	1625
• Clopyralid	Strawberry	8132	• Linuron	Dill	1432
• Cyhexatin	Mint	1715	• Linuron	Parsley	3035
• Cyprodinil + Fludioxonil	Onion (Green & Dry Bulb)	5033	• MBTA-HCL	Grapefruit	7785

## Attachment 7 (Continued)

<b>CHEMICAL</b>	<b>COMMODITY</b>	<b>PR#</b>	<b>CHEMICAL</b>	<b>COMMODITY</b>	<b>PR#</b>
• MCPA	Clover (Seed)	6527	• Propiconazole	Beet (Garden)	6352
• MCPA	Flax	5000	• Propiconazole	Parsley	6351
• MCPA	Pea (Dry)	4999	• Propiconazole	Pineapple	6585
• MCPB	Mint	4757	• Pyriproxyfen	Grape	7232
• Mefenoxam	Bean (Snap)	8371	• Pyriproxyfen	Strawberry	8106
• Mefenoxam	Caneberry	3078	• Pyriproxyfen	Tomato (Greenhouse)	7412
• Mefenoxam	Papaya	8449	• Quinoxifen	Cantaloup	7252
			• Quinoxifen	Lettuce	8367
			• S-Metolachlor	Caneberry	3497
• NAA	Grapefruit	7578	• Sethoxydim	Borage	7208
• NAA	Pomegranate	5389	• Sethoxydim	Buckwheat	1348
• NAA	Tangerine	6025	• Sethoxydim	Cantaloup	7343
• Oxyfluorfen	Rhubarb	6592	• Sethoxydim	Cucumber	7344
• Oxyfluorfen	Sweetpotato	3939	• Sethoxydim	Dill	7297
• Paraquat	Broccoli	1475	• Sethoxydim	Greens (Mustard)	6291
• Paraquat	Cabbage	1479	• Sethoxydim	Okra	2339
• Paraquat	Pea (Succulent)	5193	• Sethoxydim	Pepper	7722
• Paraquat	Safflower	2939	• Sethoxydim	Radish	2469
• Pendimethalin	Artichoke	6623	• Sulfentrazone	Watermelon	7917
• Pendimethalin	Asparagus	6660	• Tebuconazole	Barley	6513
• Pendimethalin	Broccoli	6505	• Tebuconazole	Beet (Garden)	6353
• Pendimethalin	Cabbage	6387	• Tebuconazole	Greens (Mustard)	6233
• Pendimethalin	Fig	6607	• Tebuconazole	Onion (Green)	7245
• Pendimethalin	Grape	5740	• Tebuconazole	Onion, Garlic	8365
• Pendimethalin	Grasses (Seed)	4912	• Thiamethoxam	Artichoke	8282
• Pendimethalin	Greens (Mustard)	1986	• Thiamethoxam	Barley	7746
• Pendimethalin	Kenaf	5208	• Thiamethoxam	Caneberry	8039
• Pendimethalin	Kiwifruit	6681	• Thiamethoxam	Hops	8451
• Pendimethalin	Onion (Green)	5097	• Thifensulfuron- Methyl	Safflower	3454
• Pendimethalin	Strawberry	2739			
• Pendimethalin	Turnip Greens	1987	• Thiophanate Methyl	Sunflower	5352
• Phenmedipham	Spinach	5693			
• Prometryn	Carrot	1682	• Triadimefon	Mayhaw	4274
• Prometryn	Parsley	3618	• Tribenuron- Methyl	Sunflower	8138
• Prometryn	Parsley	5160			
• Pronamide	Caneberry	3593	• Ziram	Pepper (Bell)	4088
• Pronamide	Chicory (Roots)	6474	• Zoxamide	Greens (Mustard)	7983
• Pronamide	Chicory (Roots)	6729	• Zoxamide	Spinach	7485
• Pronamide	Cranberry	3152	• Zoxamide	Sunflower	7809
• Pronamide	Dandelion	3488	• Zoxamide	Taro	8122
• Pronamide	Grasses (Pasture)	2297			

## Attachment 8

### Ornamental Pest Control Clearances - 2003

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>	<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Acephate	Aster	19245A	• Chlorfenapyr	Windflower, Lily-Of-The-Field (Anemone)	21427A
• Acephate	Blanket Flower (Gaillardia)	19238A	• Chlorfenapyr	Zinnia	21664A
• Acephate	Blanket Flower (Gaillardia)	19239A	• Chlorothalonil	Camellia	02035A
• Acephate	Boston Daisy (Argyranthemum)	19243A	• Chlorothalonil	Camellia	02036A
• Acephate	English Daisy ( <i>Bellis perennis</i> )	19247A	• Chlorothalonil	Devils Walking Stick ( <i>Aralia spinosa</i> )	08626A
• Acephate	Jacob's Ladder (Polemonium)	19282A	• Chlorothalonil + Thiophanate Methyl	Japanese Spurge ( <i>Pachysandra terminalis</i> )	18967A
• Acephate	Jacob's Ladder (Polemonium)	19283A	• Chlorothalonil + Thiophanate Methyl	Japanese Spurge ( <i>Pachysandra terminalis</i> )	18972A
• Acephate	Japanese Spurge ( <i>Pachysandra terminalis</i> )	01488A	• Chlorothalonil + Thiophanate Methyl	Lily, Plantain (Hosta)	21389A
• Acephate	Namaqualand Daisy (Venidium)	19289A	• Copper Hydroxide (Kocide)	Aster	02850A
• Acephate	Pansy (Viola)	03111A	• Copper Hydroxide (Kocide)	Aster	02851A
• Acephate	Shrub Verbena (Lantana)	19264A	• Copper Hydroxide (Kocide)	Hawthorn (Crateagus)	04213A
• Acephate	Transvaal Daisy (Gerbera)	12712A	• Copper Hydroxide (Kocide)	Larkspur (Delphinium)	07713A
• Acephate	Zinnia	03115A	• Copper Hydroxide (Kocide)	Larkspur (Delphinium)	07717A
• Acetamiprid	Chrysanthemum	17140A	• Copper Hydroxide (Kocide)	Yew (Taxus)	04814A
• Acetamiprid	Chrysanthemum	17142A	• Copper Hydroxide + Mancozeb	Aglaonema	19110A
• Acetamiprid	Chrysanthemum	17143A	• Copper Hydroxide + Mancozeb	Balsam (Impatiens)	12533A
• Acetamiprid	Mallow, Rose Mallow (Hibiscus)	17144A	• Copper Hydroxide + Mancozeb	Balsam (Impatiens)	12535A
• Acetamiprid	Mallow, Rose Mallow (Hibiscus)	17145A	• Copper Hydroxide + Mancozeb	Chrysanthemum	18131A
• Acetamiprid	Mallow, Rose Mallow (Hibiscus)	17146A	• Copper Hydroxide + Mancozeb	Chrysanthemum	18138A
• Azoxystrobin	Poinsettia ( <i>Euphorbia pulcherrima</i> )	23592A	• Copper Hydroxide + Mancozeb	Chrysanthemum	18145A
• <i>Bacillus subtilis</i>	Balsam (Impatiens)	20316A	• Copper Hydroxide + Mancozeb	Crabapple (Non-Bearing) (Malus)	21351A
• <i>Bacillus subtilis</i>	Chrysanthemum	20313A	• Copper Hydroxide + Mancozeb	Crabapple (Non-Bearing) (Malus)	21352A
• <i>Bacillus subtilis</i>	Creeping Phlox, Moss Pink ( <i>Phlox subulata</i> )	18948A	• Copper Hydroxide + Mancozeb	Dumb Cane (Dieffenbachia)	18134A
• <i>Bacillus subtilis</i>	Creeping Phlox, Moss Pink ( <i>Phlox subulata</i> )	18952A	• Copper Hydroxide + Mancozeb	Dumb Cane (Dieffenbachia)	18141A
• <i>Bacillus subtilis</i>	Geranium (Pelargonium)	18938A	• Copper Hydroxide + Mancozeb	Dumb Cane (Dieffenbachia)	18148A
• <i>Bacillus subtilis</i>	Geranium (Pelargonium)	18943A	• Copper Hydroxide + Mancozeb	English Ivy ( <i>Hedera helix</i> )	18135A
• <i>Bacillus subtilis</i>	Lilac (Syringa)	18951A	• Copper Hydroxide + Mancozeb	English Ivy ( <i>Hedera helix</i> )	18149A
• <i>Bacillus subtilis</i>	Lilac (Syringa)	18955A			
• <i>Bacillus subtilis</i>	New Guinea Impatiens ( <i>I. wallerana</i> )	20318A			
• <i>Bacillus subtilis</i>	Petunia	20315A			
• <i>Bacillus subtilis</i>	Petunia	23685A			
• <i>Bacillus subtilis</i>	Sage (Salvia x sylvestris)	20310A			
• <i>Bacillus subtilis</i>	Vervain (Verbena)	20314A			
• Chitosan	Chrysanthemum	20894A			
• Chlorfenapyr	Fern (Polypodium)	21476A			
• Chlorfenapyr	Lily, Plantain (Hosta)	21490A			
• Chlorfenapyr	Patience Plant, Zanzibar Balsam ( <i>Impatiens wallerana</i> )	23173A			
• Chlorfenapyr	Peony (Paeonia)	21478A			
• Chlorfenapyr	Rose (Rosa)	23172A			



<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Copper Hydroxide + Mancozeb	Geranium (Pelargonium)	18136A
• Copper Hydroxide + Mancozeb	Geranium (Pelargonium)	18143A
• Copper Hydroxide + Mancozeb	Geranium (Pelargonium)	18150A
• Copper Hydroxide + Mancozeb	Larkspur (Delphinium)	18132A
• Copper Hydroxide + Mancozeb	Larkspur (Delphinium)	18146A
• Copper Hydroxide + Mancozeb	Lilac (Syringa)	21355A
• Copper Hydroxide + Mancozeb	Lilac (Syringa)	21356A
• Copper Hydroxide + Mancozeb	Nephthytis, African Evergreen ( <i>Syngonium podophyllum</i> )	06363A
• Copper Hydroxide + Mancozeb	Nephthytis, African Evergreen ( <i>Syngonium podophyllum</i> )	19119A
• Copper Hydroxide + Mancozeb	Palm	19122A
• Copper Hydroxide + Mancozeb	Palm	19123A
• Copper Hydroxide + Mancozeb	Palm, Areca ( <i>Chrysalidocarpus lutescons</i> )	19106A
• Copper Hydroxide + Mancozeb	Palm, Areca ( <i>Chrysalidocarpus lutescons</i> )	19107A
• Copper Hydroxide + Mancozeb	Palm, Fan (Chamaerops)	19104A
• Copper Hydroxide + Mancozeb	Palm, Fan (Chamaerops)	19105A
• Copper Hydroxide + Mancozeb	Pear (Non-Bearing) ( <i>Pyrus communis</i> )	21353A
• Copper Hydroxide + Mancozeb	Pear (Non-Bearing) ( <i>Pyrus communis</i> )	21354A
• Copper Hydroxide + Mancozeb	Persian Violet (Cyclamen)	19120A
• Copper Hydroxide + Mancozeb	Persian Violet (Cyclamen)	19121A
• Copper Hydroxide + Mancozeb	Rose Periwinkle ( <i>Catharanthus roseus</i> )	19114A
• Copper Hydroxide + Mancozeb	Tailflower (Anthurium)	18133A
• Copper Hydroxide + Mancozeb	Tailflower (Anthurium)	18147A
• Copper Hydroxide + Mancozeb	Tailflower (Anthurium)	19111A
• Copper Hydroxide + Mancozeb	Zinnia	18137A
• Copper Hydroxide + Mancozeb	Zinnia	18144A
• Copper Hydroxide + Mancozeb	Zinnia	18151A
• Diazinon (E)	Chrysanthemum	12474A
• Dikegulac Sodium	Vervain (Verbena)	23280A
• Dikegulac Sodium	Vervain (Verbena)	23325A
• Dimethoate	Arborvitae (Thuja)	12717A
• Dimethoate	Hackberry (Celtis)	08041A
• Dimethoate	Poinsettia ( <i>Euphorbia pulcherrima</i> )	06781A
• Dimethomorph	African Violet (Saintpaulia)	20323A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Dimethomorph	California Fuschia ( <i>Zauschneria californica</i> )	23130A
• Dimethomorph	California Fuschia ( <i>Zauschneria californica</i> )	23131A
• Dimethomorph	China Aster ( <i>Callistephium chinensis</i> )	20319A
• Dimethomorph	Geranium (Pelargonium)	23128A
• Dimethomorph	Geranium (Pelargonium)	23129A
• Dimethomorph	Honeysuckle (Lonicera)	19024A
• Dimethomorph	Indian Hawthorn ( <i>Raphiolepis indica</i> )	19025A
• Dimethomorph	Oak (Quercus)	20324A
• Dimethomorph	Poinsettia ( <i>Euphorbia pulcherrima</i> )	20321A
• Dimethomorph	Poinsettia ( <i>Euphorbia pulcherrima</i> )	23134A
• Dimethomorph	Rhododendron	19022A
• Dimethomorph	Rhododendron	19023A
• Dimethomorph	Snapdragon ( <i>Antirrhinum majus</i> )	23132A
• Dimethomorph	Snapdragon ( <i>Antirrhinum majus</i> )	23133A
• Dimethomorph	Transvaal Daisy (Gerbera)	20322A
• Dimethomorph	Vervain (Verbena)	20320A
• Dimethomorph + Mancozeb	Geranium (Pelargonium)	23135A
• Dimethomorph + Mancozeb	Madwort (Alyssum)	20328A
• Dimethomorph + Mancozeb	Pansy (Viola)	19028A
• Dimethomorph + Mancozeb	Pansy (Viola)	19029A
• Dimethomorph + Mancozeb	Poinsettia ( <i>Euphorbia pulcherrima</i> )	23139A
• Dimethomorph + Mancozeb	Poinsettia ( <i>Euphorbia pulcherrima</i> )	23140A
• Dimethomorph + Mancozeb	Rose (Rosa)	20330A
• Dimethomorph + Mancozeb	Snapdragon ( <i>Antirrhinum majus</i> )	19032A
• Dimethomorph + Mancozeb	Snapdragon ( <i>Antirrhinum majus</i> )	19033A
• Dimethomorph + Mancozeb	Snapdragon ( <i>Antirrhinum majus</i> )	23138A
• Dimethomorph + Mancozeb	Speedwell, Brooklime (Veronica)	20334A
• Dimethomorph + Mancozeb	Statice (Limonium)	20335A
• Dimethomorph + Mancozeb	Stock ( <i>Matthiola incana</i> )	20336A
• Dimethomorph + Mancozeb	Vervain (Verbena)	19030A
• Dimethomorph + Mancozeb	Vervain (Verbena)	19031A
• Endosulfan	Poinsettia ( <i>Euphorbia pulcherrima</i> )	21684A
• Ethephon	Apple (Non-Bearing) (Malus)	18804A
• Ethephon	Japanese Rose, Turkestan Rose ( <i>Rosa rugosa</i> )	18812A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Ethephon	Japanese Rose, Turkestan Rose ( <i>Rosa rugosa</i> )	18815A
• Fenamidone	Periwinkle (Vinca)	23619A
• Fenamidone	Poinsettia ( <i>Euphorbia pulcherrima</i> )	23617A
• Fenhexamid	Ash (Fraxinus)	21406A
• Fenhexamid	Cherry (Non-Bearing) ( <i>Prunus</i> sp.)	21408A
• Fenhexamid	Crabapple (Non-Bearing) (Malus)	21404A
• Fenhexamid	Fir (Abies)	21078A
• Fenhexamid	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	19133A
• Fenhexamid	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	21077A
• Fenhexamid	Hemlock, Western ( <i>Tsuga heterophylla</i> )	19135A
• Fenhexamid	Hemlock, Western ( <i>Tsuga heterophylla</i> )	21079A
• Fenhexamid	Magnolia	21402A
• Fenhexamid	Maple (Acer)	21403A
• Fenhexamid	Oak (Quercus)	21405A
• Fenhexamid	Peach (Non-Bearing) ( <i>Prunus persica</i> )	21407A
• Fenhexamid	Rose (Rosa)	21401A
• Fenhexamid	Tulip (Tulipa)	17201A
• Fenpyroximate	Ash (Fraxinus)	23174A
• Fenpyroximate	Azalea (Rhododendron)	20178A
• Fenpyroximate	Birch (Betula)	23175A
• Fenpyroximate	Box elder ( <i>Acer negundo</i> )	23176A
• Fenpyroximate	Cotoneaster	20182A
• Fenpyroximate	Elm (Ulmus)	23177A
• Fenpyroximate	Filbert, Hazelnut (Non-Bearing) ( <i>Corylus</i> )	23178A
• Fenpyroximate	Firethorn (Pyracantha)	20184A
• Fenpyroximate	Hackberry (Celtis)	23179A
• Fenpyroximate	Hawthorn (Crateagus)	23180A
• Fenpyroximate	Hickory (Carya)	23181A
• Fenpyroximate	Holly (Ilex)	20176A
• Fenpyroximate	Juniper (Juniperus)	20180A
• Fenpyroximate	Linden, Basswood (Tilia)	23182A
• Fenpyroximate	Maple (Acer)	23183A
• Fenpyroximate	Mountain Ash (Sorbus)	23184A
• Fenpyroximate	Oak (Quercus)	23185A
• Fenpyroximate	Peach (Non-Bearing) ( <i>Prunus persica</i> )	20186A
• Fenpyroximate	Poplar (Populus)	23186A
• Fenpyroximate	Rose (Rosa)	23734A
• Fenpyroximate	Serviceberry (Amelanchier)	23187A
• Flumioxazin (G)	Abelia	19951A
• Flumioxazin (G)	Abelia	20008A
• Flumioxazin (G)	Andromeda (Pieris)	19997A
• Flumioxazin (G)	Apple (Non-Bearing) (Malus)	16794A
• Flumioxazin (G)	Arborvitae (Thuja)	19755A
• Flumioxazin (G)	Arborvitae (Thuja)	19814A
• Flumioxazin (G)	Arrowwood (Viburnum)	19756A
• Flumioxazin (G)	Arrowwood (Viburnum)	19815A
• Flumioxazin (G)	Ash (Fraxinus)	19871A
• Flumioxazin (G)	Ash (Fraxinus)	19912A
• Flumioxazin (G)	Azalea (Rhododendron)	19745A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Flumioxazin (G)	Azalea (Rhododendron)	19805A
• Flumioxazin (G)	Barberry (Berberis)	19963A
• Flumioxazin (G)	Barberry (Berberis)	20020A
• Flumioxazin (G)	Birch, Paper ( <i>Betula papyrifera</i> )	19900A
• Flumioxazin (G)	Birch, River ( <i>Betula nigra</i> )	19899A
• Flumioxazin (G)	Blueberry (Non-Bearing) ( <i>Vaccinium</i> sp.)	19801A
• Flumioxazin (G)	Blueberry (Non-Bearing) ( <i>Vaccinium</i> sp.)	19860A
• Flumioxazin (G)	Bottlebrush (Callistemon)	19965A
• Flumioxazin (G)	Bottlebrush (Callistemon)	20022A
• Flumioxazin (G)	Boxwood (Buxus)	19964A
• Flumioxazin (G)	Boxwood (Buxus)	20021A
• Flumioxazin (G)	Bridal-Wreath (Spirea)	19750A
• Flumioxazin (G)	Bridal-Wreath (Spirea)	19809A
• Flumioxazin (G)	Butterfly Bush ( <i>Buddleia davidii</i> )	19874A
• Flumioxazin (G)	Butterfly Bush ( <i>Buddleia davidii</i> )	19888A
• Flumioxazin (G)	Cedar, Red ( <i>Juniperus virginiana</i> )	19917A
• Flumioxazin (G)	Cherry (Non-Bearing) ( <i>Prunus</i> sp.)	19939A
• Flumioxazin (G)	Cleyera ( <i>Cleyera japonica</i> )	19973A
• Flumioxazin (G)	Cleyera ( <i>Cleyera japonica</i> )	20030A
• Flumioxazin (G)	Cotoneaster	19976A
• Flumioxazin (G)	Cotoneaster	20033A
• Flumioxazin (G)	Cottonwood, Fremont ( <i>Populus fremontii</i> )	19937A
• Flumioxazin (G)	Crape Myrtle ( <i>Lagerstroemia indica</i> )	19893A
• Flumioxazin (G)	Cypress (Cupressus)	19908A
• Flumioxazin (G)	Deutzia	19979A
• Flumioxazin (G)	Deutzia	20036A
• Flumioxazin (G)	Dogwood, Flowering ( <i>Cornus florida</i> )	19866A
• Flumioxazin (G)	Dogwood, Flowering ( <i>Cornus florida</i> )	19880A
• Flumioxazin (G)	Dogwood, Red Osier ( <i>Cornus sericea</i> )	19974A
• Flumioxazin (G)	Elm, Chinese ( <i>Ulmus parvifolia</i> )	19950A
• Flumioxazin (G)	English Ivy ( <i>Hedera helix</i> )	19779A
• Flumioxazin (G)	English Ivy ( <i>Hedera helix</i> )	19838A
• Flumioxazin (G)	False cypress ( <i>Chamaecyparis obtusa</i> )	23642A
• Flumioxazin (G)	Fir (Abies)	19869A
• Flumioxazin (G)	Fir (Abies)	19883A
• Flumioxazin (G)	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	19895A
• Flumioxazin (G)	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	19896A
• Flumioxazin (G)	Firethorn (Pyracantha)	20005A
• Flumioxazin (G)	Firethorn (Pyracantha)	20062A
• Flumioxazin (G)	Golden Bells (Forsythia)	19984A
• Flumioxazin (G)	Heath (Erica)	19982A
• Flumioxazin (G)	Heather (Calluna)	19966A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Flumioxazin (G)	Heavenly Bamboo ( <i>Nandina domestica</i> )	19993A
• Flumioxazin (G)	Hemlock (Tsuga)	19898A
• Flumioxazin (G)	Hemlock, Canada ( <i>Tsuga canadensis</i> )	19949A
• Flumioxazin (G)	Holly (Ilex)	19989A
• Flumioxazin (G)	Holly (Ilex)	20046A
• Flumioxazin (G)	Honeysuckle (Lonicera)	19990A
• Flumioxazin (G)	Honeysuckle (Lonicera)	20047A
• Flumioxazin (G)	Hydrangea	20155A
• Flumioxazin (G)	Indian Hawthorn ( <i>Raphiolepis indica</i> )	20006A
• Flumioxazin (G)	Indian Hawthorn ( <i>Raphiolepis indica</i> )	20063A
• Flumioxazin (G)	Japanese Pittosporum ( <i>Pittosporum tobira</i> )	19999A
• Flumioxazin (G)	Japanese Pittosporum ( <i>Pittosporum tobira</i> )	20056A
• Flumioxazin (G)	Japanese Spurge ( <i>Pachysandra terminalis</i> )	19853A
• Flumioxazin (G)	Juniper (Juniperus)	19864A
• Flumioxazin (G)	Juniper (Juniperus)	19878A
• Flumioxazin (G)	Lilac (Syringa)	19751A
• Flumioxazin (G)	Magnolia, Southern ( <i>Magnolia grandiflora</i> )	19919A
• Flumioxazin (G)	Maidenhair Tree ( <i>Ginkgo biloba</i> )	19913A
• Flumioxazin (G)	Maple (Acer)	19870A
• Flumioxazin (G)	Maple (Acer)	19884A
• Flumioxazin (G)	Maple, Amur ( <i>Acer ginnala</i> )	19954A
• Flumioxazin (G)	Maple, Amur ( <i>Acer ginnala</i> )	20011A
• Flumioxazin (G)	Maple, Japanese ( <i>Acer palmatum</i> )	19955A
• Flumioxazin (G)	Maple, Japanese ( <i>Acer palmatum</i> )	20012A
• Flumioxazin (G)	Mulberry (Morus)	19920A
• Flumioxazin (G)	Oak, Bear ( <i>Quercus ilicifolia</i> )	19940A
• Flumioxazin (G)	Oak, Pin ( <i>Quercus palustris</i> )	19941A
• Flumioxazin (G)	Oak, Red ( <i>Quercus rubra</i> )	19943A
• Flumioxazin (G)	Oak, Willow ( <i>Quercus phellos</i> )	19942A
• Flumioxazin (G)	Oleander, Rosebay ( <i>Nerium oleander</i> )	19994A
• Flumioxazin (G)	Peach (Non-Bearing) ( <i>Prunus persica</i> )	14811A
• Flumioxazin (G)	Photinia	19996A
• Flumioxazin (G)	Pine (Pinus)	19868A
• Flumioxazin (G)	Pine (Pinus)	19882A
• Flumioxazin (G)	Pine, Mugo & Mugho ( <i>Pinus mugo</i> )	19928A
• Flumioxazin (G)	Pine, Mugo & Mugho ( <i>Pinus mugo</i> )	19998A
• Flumioxazin (G)	Plum (Non-Bearing) ( <i>Prunus</i> sp.)	19797A
• Flumioxazin (G)	Plum (Non-Bearing) ( <i>Prunus</i> sp.)	19856A
• Flumioxazin (G)	Red Bud, Eastern ( <i>Cercis canadensis</i> )	19873A
• Flumioxazin (G)	Red Bud, Eastern ( <i>Cercis canadensis</i> )	19887A
• Flumioxazin (G)	Rhododendron	19744A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Flumioxazin (G)	Rhododendron	19804A
• Flumioxazin (G)	Russian Olive ( <i>Elaeagnus angustifolia</i> )	20007A
• Flumioxazin (G)	Spindle Tree ( <i>Euonymus japonica</i> )	19983A
• Flumioxazin (G)	Spindle Tree ( <i>Euonymus japonica</i> )	20040A
• Flumioxazin (G)	Spruce (Picea)	19867A
• Flumioxazin (G)	Spruce, Dwarf Alberta ( <i>Picea glauca conica</i> )	19924A
• Flumioxazin (G)	Spruce, Norway ( <i>Picea abies</i> )	19923A
• Flumioxazin (G)	Sumac (Rhus)	19806A
• Flumioxazin (G)	Sweetgum (Liquidambar)	19918A
• Flumioxazin (G)	Sycamore (Platanus)	19934A
• Flumioxazin (G)	Sycamore, California ( <i>Platanus racemosa</i> )	19935A
• Flumioxazin (G)	Weigela	19757A
• Flumioxazin (G)	Weigela	19816A
• Flumioxazin (G)	Winged Euonymus ( <i>Euonymus alata</i> )	20156A
• Flumioxazin (G)	Yew (Taxus)	19752A
• Flumioxazin (G)	Yew (Taxus)	19811A
• Flumioxazin (WDG)	Abelia	20483A
• Flumioxazin (WDG)	Abelia	20537A
• Flumioxazin (WDG)	Arborvitae (Thuja)	20296A
• Flumioxazin (WDG)	Arborvitae (Thuja)	20381A
• Flumioxazin (WDG)	Arrowwood (Viburnum)	20297A
• Flumioxazin (WDG)	Arrowwood (Viburnum)	20382A
• Flumioxazin (WDG)	Ash (Fraxinus)	20420A
• Flumioxazin (WDG)	Azalea (Rhododendron)	20373A
• Flumioxazin (WDG)	Barberry (Berberis)	20494A
• Flumioxazin (WDG)	Birch, Paper ( <i>Betula papyrifera</i> )	20441A
• Flumioxazin (WDG)	Birch, River ( <i>Betula nigra</i> )	20440A
• Flumioxazin (WDG)	Blueberry (Non-Bearing) ( <i>Vaccinium</i> sp.)	20410A
• Flumioxazin (WDG)	Bottlebrush (Callistemon)	20496A
• Flumioxazin (WDG)	Bottlebrush (Callistemon)	20547A
• Flumioxazin (WDG)	Boxwood (Buxus)	20546A
• Flumioxazin (WDG)	Bridal-Wreath (Spirea)	19337A
• Flumioxazin (WDG)	Butterfly Bush ( <i>Buddleia davidii</i> )	20423A
• Flumioxazin (WDG)	Butterfly Bush ( <i>Buddleia davidii</i> )	20432A
• Flumioxazin (WDG)	Cedar ( <i>Cedrus deodara</i> )	23646A
• Flumioxazin (WDG)	Cherry (Non-Bearing) ( <i>Prunus</i> sp.)	20471A
• Flumioxazin (WDG)	Cleyera ( <i>Cleyera japonica</i> )	20553A
• Flumioxazin (WDG)	Cotoneaster	20506A
• Flumioxazin (WDG)	Cotoneaster	20556A
• Flumioxazin (WDG)	Cottonwood, Fremont ( <i>Populus fremontii</i> )	20470A
• Flumioxazin (WDG)	Cypress (Cupressus)	20447A
• Flumioxazin (WDG)	Deutzia	20509A
• Flumioxazin (WDG)	Deutzia	20559A
• Flumioxazin (WDG)	Dogwood, Flowering ( <i>Cornus florida</i> )	20415A
• Flumioxazin (WDG)	Dogwood, Flowering ( <i>Cornus florida</i> )	20425A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Flumioxazin (WDG)	Elm, Chinese ( <i>Ulmus parvifolia</i> )	20482A
• Flumioxazin (WDG)	English Ivy ( <i>Hedera helix</i> )	20058A
• Flumioxazin (WDG)	False cypress ( <i>Chamaecyparis obtusa</i> )	23641A
• Flumioxazin (WDG)	Fir (Abies)	20428A
• Flumioxazin (WDG)	Fir, Balsam ( <i>Abies balsamea</i> )	23651A
• Flumioxazin (WDG)	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	20435A
• Flumioxazin (WDG)	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	20436A
• Flumioxazin (WDG)	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	23649A
• Flumioxazin (WDG)	Fir, Grand; Giant Fir ( <i>Abies grandis</i> )	23650A
• Flumioxazin (WDG)	Firethorn (Pyracantha)	20534A
• Flumioxazin (WDG)	Firethorn (Pyracantha)	20577A
• Flumioxazin (WDG)	Golden Bells (Forsythia)	20563A
• Flumioxazin (WDG)	Hemlock (Tsuga)	20437A
• Flumioxazin (WDG)	Hemlock (Tsuga)	20438A
• Flumioxazin (WDG)	Hemlock, Canada ( <i>Tsuga canadensis</i> )	20481A
• Flumioxazin (WDG)	Honeysuckle (Lonicera)	20519A
• Flumioxazin (WDG)	Honeysuckle (Lonicera)	20567A
• Flumioxazin (WDG)	Indian Hawthorn ( <i>Raphiolepis indica</i> )	20578A
• Flumioxazin (WDG)	Japanese Pittosporum ( <i>Pittosporum tobira</i> )	20528A
• Flumioxazin (WDG)	Japanese Pittosporum ( <i>Pittosporum tobira</i> )	20572A
• Flumioxazin (WDG)	Japanese Spurge ( <i>Pachysandra terminalis</i> )	20362A
• Flumioxazin (WDG)	Japanese Spurge ( <i>Pachysandra terminalis</i> )	20405A
• Flumioxazin (WDG)	Jasmine, Cape, Common Gardenia (Gardenia)	20515A
• Flumioxazin (WDG)	Jasmine, Cape, Common Gardenia (Gardenia)	20564A
• Flumioxazin (WDG)	Jasmine, Jessamine (Jasminum)	20352A
• Flumioxazin (WDG)	Juniper (Juniperus)	20413A
• Flumioxazin (WDG)	Juniper (Juniperus)	20424A
• Flumioxazin (WDG)	Lilac (Syringa)	19338A
• Flumioxazin (WDG)	Maidenhair Tree ( <i>Ginkgo biloba</i> )	20449A
• Flumioxazin (WDG)	Maple (Acer)	20419A
• Flumioxazin (WDG)	Maple (Acer)	20429A
• Flumioxazin (WDG)	Maple, Japanese ( <i>Acer palmatum</i> )	20487A
• Flumioxazin (WDG)	Maple, Japanese ( <i>Acer palmatum</i> )	20539A
• Flumioxazin (WDG)	Mulberry (Morus)	20455A
• Flumioxazin (WDG)	Oak, Live;Southern ( <i>Quercus virginiana</i> )	20476A
• Flumioxazin (WDG)	Oak, Pin ( <i>Quercus palustris</i> )	20473A
• Flumioxazin (WDG)	Oak, Willow ( <i>Quercus phellos</i> )	20474A
• Flumioxazin (WDG)	Oleander, Rosebay ( <i>Nerium oleander</i> )	20523A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Flumioxazin (WDG)	Photinia	20525A
• Flumioxazin (WDG)	Pine (Pinus)	20427A
• Flumioxazin (WDG)	Pine (Pinus)	23647A
• Flumioxazin (WDG)	Pine, Mugo & Mugho ( <i>Pinus mugo</i> )	20461A
• Flumioxazin (WDG)	Pine, Mugo & Mugho ( <i>Pinus mugo</i> )	20527A
• Flumioxazin (WDG)	Pine, Scotch ( <i>Pinus sylvestris</i> )	20465A
• Flumioxazin (WDG)	Pine, White ( <i>Pinus strobus</i> )	20464A
• Flumioxazin (WDG)	Purple Anise ( <i>Illicium floridanum</i> )	20451A
• Flumioxazin (WDG)	Red Bud, Eastern ( <i>Cercis canadensis</i> )	20422A
• Flumioxazin (WDG)	Red Bud, Eastern ( <i>Cercis canadensis</i> )	20431A
• Flumioxazin (WDG)	Rhododendron	20372A
• Flumioxazin (WDG)	Spruce, Dwarf Alberta ( <i>Picea glauca conica</i> )	20458A
• Flumioxazin (WDG)	Spruce, Norway ( <i>Picea abies</i> )	20457A
• Flumioxazin (WDG)	Sweetgum (Liquidambar)	20453A
• Flumioxazin (WDG)	Sycamore, California ( <i>Platanus racemosa</i> )	20468A
• Flumioxazin (WDG)	Weeping Fig, Benjamin Tree ( <i>Ficus benjamina</i> )	19885A
• Flumioxazin (WDG)	Weeping Fig, Benjamin Tree ( <i>Ficus benjamina</i> )	20396A
• Flumioxazin (WDG)	Weigela	20308A
• Flumioxazin (WDG)	Weigela	20383A
• Flumioxazin (WDG)	Winged Euonymus ( <i>Euonymus alata</i> )	20580A
• Flumioxazin (WDG)	Winged Euonymus ( <i>Euonymus alata</i> )	20581A
• Flumioxazin (WDG)	Yew (Taxus)	20378A
• Flutolanil	Lily (Lilium)	23104A
• Iprodione	Bulbous Iris ( <i>I. xiphium</i> )	23096A
• Iprodione	Lily (Lilium)	23105A
• Iprodione	Lily (Lilium)	23106A
• Isoxaben	Crape Myrtle ( <i>Lagerstroemia indica x Fauriei</i> )	12765A
• Isoxaben	Maple, Sugar ( <i>Acer saccharum</i> )	02465A
• Isoxaben	Rose-Of-Sharon, Althaea ( <i>Hibiscus syriacus</i> )	12756A
• Isoxaben + Trifluralin	False Spirea (Astilbe)	21430A
• Mancozeb	Cranberry (Non-Bearing) ( <i>Vaccinium macrocarpon</i> )	01543A
• Mancozeb	Lilac (Syringa)	02739A
• Mancozeb	Russian Olive ( <i>Elaeagnus angustifolia</i> )	05513A
• Mefenoxam	Peach (Non-Bearing) ( <i>Prunus persica</i> )	09373A
• Myclobutanil	Canna	19204A
• Myclobutanil	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	20238A
• Myclobutanil	Fir, Douglas ( <i>Pseudotsuga menziesii</i> )	20239A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Myclobutanil	Poplar (Populus)	19201A
• Novaluron	Chrysanthemum	19140A
• Novaluron	Coleus, Flamenettle (Coleus)	19148A
• Novaluron	Creeping Phlox, Moss Pink ( <i>Phlox subulata</i> )	19144A
• Novaluron	Daylily (Hemerocallis)	19143A
• Novaluron	Flag (Iris)	19147A
• Novaluron	Ladies-Eardrops (Fuchsia)	19141A
• Novaluron	Poinsettia ( <i>Euphorbia pulcherrima</i> )	19142A
• Novaluron	Pothos ( <i>Epipremnum aureum</i> )	19149A
• Novaluron	Sage, Scarlet ( <i>Salvia splendens</i> )	19146A
• Novaluron	Transvaal Daisy (Gerbera)	19145A
• Oryzalin	Coneflower (Rudbeckia)	10754A
• Oryzalin	Leavenworths (Coreopsis)	17284A
• Oryzalin	Stonecrop ( <i>Sedum spectabile</i> )	12453A
• Oxadiazon (G)	African Daisy (Osteospermum)	18705A
• Oxadiazon (G)	Broom, Andorra ( <i>Cytisus purgans</i> )	20138A
• Oxyfluorfen	Pear, Bradford (Non-Bearing) ( <i>Pyrus calleryana</i> )	12865A
• Oxyfluorfen + Oryzalin (ROUT)	Baby's-Breath ( <i>Gypsophila elegans</i> )	19558A
• Oxyfluorfen + Oryzalin (ROUT)	Butterfly Blue, Scabious ( <i>Scabiosa columbara</i> )	20992A
• Oxyfluorfen + Oryzalin (ROUT)	Camellia	19581A
• Oxyfluorfen + Oryzalin (ROUT)	Daylily (Hemerocallis)	19559A
• Oxyfluorfen + Oryzalin (ROUT)	Daylily (Hemerocallis)	19577A
• Oxyfluorfen + Oryzalin (ROUT)	Dogwood, Flowering ( <i>Cornus florida</i> )	18906A
• Oxyfluorfen + Oryzalin (ROUT)	Hemlock (Tsuga)	09468A
• Oxyfluorfen + Oryzalin (ROUT)	Hemlock (Tsuga)	09540A
• Oxyfluorfen + Oryzalin (ROUT)	Hemlock (Tsuga)	19589A
• Oxyfluorfen + Oryzalin (ROUT)	Holly, Blue ( <i>Ilex x meserveae</i> )	11635A
• Oxyfluorfen + Oryzalin (ROUT)	Lilac (Syringa)	11346A
• Oxyfluorfen + Oryzalin (ROUT)	Lilac (Syringa)	19588A
• Oxyfluorfen + Oryzalin (ROUT)	Sage, Scarlet ( <i>Salvia splendens</i> )	12363A
• Oxyfluorfen + Oryzalin (ROUT)	Strawberry (Non-Bearing) ( <i>Fragaria sp.</i> )	19574A
• Oxyfluorfen + Oryzalin (ROUT)	Yarrow ( <i>Achillea millifolium</i> )	09736A
• Oxyfluorfen + Oryzalin (ROUT)	Yarrow ( <i>Achillea millifolium</i> )	12354A
• Oxyfluorfen + Oryzalin (ROUT)	Yarrow ( <i>Achillea millifolium</i> )	19567A
• Oxyfluorfen + Oryzalin (ROUT)	Yarrow ( <i>Achillea millifolium</i> )	16452A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Oxyfluorfen + Pendimethalin	Pampas Grass (Cortaderia)	23495A
• Pendimethalin	Balsam (Impatiens)	11010A
• Pendimethalin	Balsam (Impatiens)	19436A
• Pendimethalin	Mugwort, White ( <i>Artemisia lactiflora</i> )	22947A
• Pendimethalin	Strawberry (Non-Bearing) ( <i>Fragaria sp.</i> )	19450A
• Pendimethalin (G)	Chrysanthemum	11465A
• Prodiamine (WG)	Columbine (Aquilegia)	20159A
• Prodiamine (WG)	Viburnum ( <i>Viburnum suspensum</i> )	18739A
• Propiconazole	Poplar (Populus)	09976A
• <i>Pseudozyma flucculosa</i> (SPORODEX)	Rose (Rosa)	17220A
• Pymetrozine	Ash (Fraxinus)	21725A
• Pymetrozine	Ash (Fraxinus)	21726A
• Pymetrozine	Crabapple (Non-Bearing) (Malus)	21733A
• Pymetrozine	Crabapple (Non-Bearing) (Malus)	21734A
• Pymetrozine	Honey Locust (Gleditsia)	21727A
• Pymetrozine	Honey Locust (Gleditsia)	21728A
• Pymetrozine	Maple (Acer)	21723A
• Pymetrozine	Maple (Acer)	21724A
• Pymetrozine	Oak (Quercus)	21729A
• Pymetrozine	Oak (Quercus)	21730A
• Pymetrozine	Wisteria	21731A
• Pymetrozine	Wisteria	21732A
• Pymetrozine	Yew (Taxus)	18627A
• Pymetrozine	Yew (Taxus)	18628A
• Pyraclostrobin	Arrowwood (Viburnum)	21359A
• Pyraclostrobin	Arrowwood (Viburnum)	21360A
• Pyraclostrobin	Avens (Geum)	21639A
• Pyraclostrobin	Baby's-Breath ( <i>Gypsophila elegans</i> )	21640A
• Pyraclostrobin	Balsam (Impatiens)	20075A
• Pyraclostrobin	Balsam (Impatiens)	20076A
• Pyraclostrobin	Basket-Of-Gold ( <i>Aurinia saxatilis</i> )	21641A
• Pyraclostrobin	Bayberry ( <i>Myrica pensylvanica</i> )	21635A
• Pyraclostrobin	Bellflower (Campanula)	21642A
• Pyraclostrobin	Coneflower (Rudbeckia)	20094A
• Pyraclostrobin	Coral Bells, Alumroot ( <i>Heuchera sanguinea</i> )	21643A
• Pyraclostrobin	Creeping Phlox, Moss Pink ( <i>Phlox subulata</i> )	20092A
• Pyraclostrobin	Cupid's-Dart (Catananche)	21644A
• Pyraclostrobin	Dogwood, Flowering ( <i>Cornus florida</i> )	20096A
• Pyraclostrobin	Dogwood, Flowering ( <i>Cornus florida</i> )	20097A
• Pyraclostrobin	Geranium (Pelargonium)	20081A
• Pyraclostrobin	Globe Thistle (Echinops)	21645A
• Pyraclostrobin	Hollyhock ( <i>Alcea rosea</i> )	20093A
• Pyraclostrobin	Laurel (Kalmia)	21638A
• Pyraclostrobin	Leopards-Bane (Doronicum)	21646A
• Pyraclostrobin	Maidenhair Tree ( <i>Ginkgo biloba</i> )	21652A

Pest Control Agent	Commodity	PR#
• Pyraclostrobin	Rock Cress (Aubrieta)	21647A
• Pyraclostrobin	Rose (Rosa)	20086A
• Pyraclostrobin	Rose (Rosa)	20102A
• Pyraclostrobin	Rose (Rosa)	20103A
• Pyraclostrobin	Rose Periwinkle ( <i>Catharanthus roseus</i> )	20082A
• Pyraclostrobin	St.-Johns-Wort ( <i>Hypericum</i> )	2148A
• Pyraclostrobin	Wall Germander ( <i>Teucrium</i> )	21649S
• Pyraclostrobin	Winter Hazel ( <i>Corylopsis</i> )	21653A
• Pyraclostrobin	Yarrow ( <i>Achillea millifolium</i> )	21650A
• Pyridaben	Abelia	16327A
• Pyridaben	Abelia	16600A
• Pyridaben	Anise Hyssop (Agastache)	16423A
• Pyridaben	Anise Hyssop (Agastache)	16696A
• Pyridaben	Apache Plume ( <i>Fallugia paradoxa</i> )	16468A
• Pyridaben	Apache Plume ( <i>Fallugia paradoxa</i> )	16741A
• Pyridaben	Apple (Non-Bearing) ( <i>Malus</i> )	16410A
• Pyridaben	Apple (Non-Bearing) ( <i>Malus</i> )	16683A
• Pyridaben	Avens (Geum)	16479A
• Pyridaben	Avens (Geum)	16752A
• Pyridaben	Bamboo (Phyllostachys)	16564A
• Pyridaben	Bamboo (Phyllostachys)	16837A
• Pyridaben	Basket-Of-Gold ( <i>Aurinia saxatilis</i> )	16439A
• Pyridaben	Basket-Of-Gold ( <i>Aurinia saxatilis</i> )	16712A
• Pyridaben	Batchelor's Button ( <i>Centaurea</i> )	16446A
• Pyridaben	Batchelor's Button ( <i>Centaurea</i> )	16719A
• Pyridaben	Bayberry ( <i>Myrica pensylvanica</i> )	16642A
• Pyridaben	Bearberry ( <i>Arctostaphylos</i> )	16331A
• Pyridaben	Bearberry ( <i>Arctostaphylos</i> )	16604A
• Pyridaben	Beard-Tongue ( <i>Penstemon</i> sp.)	16787A
• Pyridaben	Beautyberry ( <i>Callicarpa</i> )	16336A
• Pyridaben	Beautyberry ( <i>Callicarpa</i> )	16609A
• Pyridaben	Beautybush ( <i>Kolkwitzia amabilis</i> )	16362A
• Pyridaben	Beautybush ( <i>Kolkwitzia amabilis</i> )	16635A
• Pyridaben	Beech ( <i>Fagus</i> )	16351A
• Pyridaben	Beech ( <i>Fagus</i> )	16624A
• Pyridaben	Bellflower ( <i>Campanula</i> )	16716A
• Pyridaben	Bishops Weed, Goutweed ( <i>Aegopodium podagaria</i> )	16421A
• Pyridaben	Bishops Weed, Goutweed ( <i>Aegopodium podagaria</i> )	16694A
• Pyridaben	Blazing-Star, Gayfeather ( <i>Liatris</i> )	16499A

Pest Control Agent	Commodity	PR#
• Pyridaben	Blazing-Star, Gayfeather ( <i>Liatris</i> )	16772A
• Pyridaben	Blue Stem ( <i>Schizacharium</i> )	16561A
• Pyridaben	Blue Stem ( <i>Schizacharium</i> )	16834A
• Pyridaben	Bluebeard ( <i>Caryopteris</i> )	16612A
• Pyridaben	Blueberry (Non-Bearing) ( <i>Vaccinium</i> sp.)	16382A
• Pyridaben	Blueberry (Non-Bearing) ( <i>Vaccinium</i> sp.)	16655A
• Pyridaben	Bottlebrush ( <i>Callistemon</i> )	16353A
• Pyridaben	Bottlebrush ( <i>Callistemon</i> )	16626A
• Pyridaben	Broom ( <i>Cytisus</i> )	16344A
• Pyridaben	Broom ( <i>Cytisus</i> )	16617A
• Pyridaben	Bugleweed ( <i>Ajuga</i> )	16425A
• Pyridaben	Bugleweed ( <i>Ajuga</i> )	16698A
• Pyridaben	Calamint ( <i>Calamintha</i> )	16442A
• Pyridaben	Calamint ( <i>Calamintha</i> )	16715A
• Pyridaben	Canna	16444A
• Pyridaben	Canna	16717A
• Pyridaben	Catnip ( <i>Nepeta cataria</i> )	16509A
• Pyridaben	Catnip ( <i>Nepeta cataria</i> )	16782A
• Pyridaben	Cedar ( <i>Cedrus</i> )	16307A
• Pyridaben	Cedar ( <i>Cedrus</i> )	16580A
• Pyridaben	Chameleon Plant ( <i>Houttuynia cordata</i> )	16490A
• Pyridaben	Chameleon Plant ( <i>Houttuynia cordata</i> )	16763A
• Pyridaben	Chaste Shrub ( <i>Vitex</i> )	16385A
• Pyridaben	Chaste Shrub ( <i>Vitex</i> )	16658A
• Pyridaben	Chokeberry ( <i>Aronia</i> )	16332A
• Pyridaben	Chokeberry ( <i>Aronia</i> )	16605A
• Pyridaben	Clematis	16663A
• Pyridaben	Columbine ( <i>Aquilegia</i> )	16704A
• Pyridaben	Coral Bells, Alumroot ( <i>Heuchera sanguinea</i> )	16759A
• Pyridaben	Coralberry, Snowberry ( <i>Symphoricarpos orbiculatus</i> )	16379A
• Pyridaben	Coralberry, Snowberry ( <i>Symphoricarpos orbiculatus</i> )	16652A
• Pyridaben	Creeping Wintergreen ( <i>Gaultheria</i> )	16454A
• Pyridaben	Creeping Wintergreen ( <i>Gaultheria</i> )	16627A
• Pyridaben	Cupid's-Dart (Catananche)	16718A
• Pyridaben	Cushion Spurge ( <i>Euphorbia</i> )	16467A
• Pyridaben	Cushion Spurge ( <i>Euphorbia</i> )	16740A
• Pyridaben	Cypress ( <i>Cupressus</i> )	16312A
• Pyridaben	Cypress ( <i>Cupressus</i> )	16585A
• Pyridaben	Cypress, Leyland ( <i>Cupressocyparis leylandii</i> )	16311A
• Pyridaben	Cypress, Leyland ( <i>Cupressocyparis leylandii</i> )	16584A
• Pyridaben	Daisy, Silver & Gold ( <i>Ajania</i> )	16424A
• Pyridaben	Daisy, Silver & Gold ( <i>Ajania</i> )	16697A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Pyridaben	Dawn Redwood ( <i>Metasequoia</i> )	16314A
• Pyridaben	Dawn Redwood ( <i>Metasequoia</i> )	16587A
• Pyridaben	Dead Nettle ( <i>Lamium</i> )	16495A
• Pyridaben	Dead Nettle ( <i>Lamium</i> )	16768A
• Pyridaben	Dendranthema	16458A
• Pyridaben	Dendranthema	16731A
• Pyridaben	Dogwood, Flowering ( <i>Cornus florida</i> )	16615A
• Pyridaben	Enkianthus	16294A
• Pyridaben	Enkianthus	16567A
• Pyridaben	Evening Primrose, Sundrops ( <i>Oenothera</i> )	16784A
• Pyridaben	False Sunflower ( <i>Oxeye heliopsis</i> )	16484A
• Pyridaben	False Sunflower ( <i>Oxeye heliopsis</i> )	16757A
• Pyridaben	Feather Grass, Needlegrass ( <i>Stipa</i> )	16563A
• Pyridaben	Feather Grass, Needlegrass ( <i>Stipa</i> )	16836A
• Pyridaben	Fern, Autumn, Shield, Wood ( <i>Dryopteris</i> )	16470A
• Pyridaben	Fern, Autumn, Shield, Wood ( <i>Dryopteris</i> )	16743A
• Pyridaben	Fern, Japanese Painted ( <i>Athyrium goeringianum</i> )	16471A
• Pyridaben	Fern, Japanese Painted ( <i>Athyrium goeringianum</i> )	16744A
• Pyridaben	Fern, Royal, Flowering Fern ( <i>Osmunda</i> )	16472A
• Pyridaben	Fern, Royal, Flowering Fern ( <i>Osmunda</i> )	16745A
• Pyridaben	Fescue ( <i>Festuca</i> )	16551A
• Pyridaben	Fescue ( <i>Festuca</i> )	16824A
• Pyridaben	Fetterbush, Drooping Leucothoe ( <i>Leucothoe</i> )	16571A
• Pyridaben	Filbert, Hazelnut (Non-Bearing) ( <i>Corylus</i> )	16343A
• Pyridaben	Filbert, Hazelnut (Non-Bearing) ( <i>Corylus</i> )	16616A
• Pyridaben	Fleabane ( <i>Erigeron</i> )	16465A
• Pyridaben	Fleabane ( <i>Erigeron</i> )	16738A
• Pyridaben	Fleece Flower, Knotweed ( <i>Polygonum</i> )	16516A
• Pyridaben	Fleece Flower, Knotweed ( <i>Polygonum</i> )	16789A
• Pyridaben	Flowering Quince ( <i>Chaenomeles</i> )	16613A
• Pyridaben	Foamflower, False Miterwort ( <i>Tiarella</i> )	16537A
• Pyridaben	Foamflower, False Miterwort ( <i>Tiarella</i> )	16810A
• Pyridaben	Foamy Bells ( <i>Heucherella</i> )	16487A
• Pyridaben	Foamy Bells ( <i>Heucherella</i> )	16760A
• Pyridaben	Fountain Grass ( <i>Pennisetum setaceum</i> )	16560A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Pyridaben	Fountain Grass ( <i>Pennisetum setaceum</i> )	16833A
• Pyridaben	Globe Thistle ( <i>Echinops</i> )	16464A
• Pyridaben	Globe Thistle ( <i>Echinops</i> )	16737A
• Pyridaben	Goatsbeard ( <i>Aruncus</i> )	16435A
• Pyridaben	Goatsbeard ( <i>Aruncus</i> )	16708A
• Pyridaben	Golden Bells ( <i>Forsythia</i> )	16352A
• Pyridaben	Golden Bells ( <i>Forsythia</i> )	16625A
• Pyridaben	Golden Larch ( <i>Pseudolarix</i> )	16318A
• Pyridaben	Golden Larch ( <i>Pseudolarix</i> )	16591A
• Pyridaben	Golden Ray ( <i>Ligularia</i> )	16500A
• Pyridaben	Golden Ray ( <i>Ligularia</i> )	16773A
• Pyridaben	Golden Star ( <i>Chrysogonum</i> )	16451A
• Pyridaben	Golden Star ( <i>Chrysogonum</i> )	16724A
• Pyridaben	Golden-Chain ( <i>Laburnum anagyroides</i> )	16407A
• Pyridaben	Golden-Chain ( <i>Laburnum anagyroides</i> )	16680A
• Pyridaben	Golden-Rain Tree ( <i>Koelreuteria bipinnata</i> )	16406A
• Pyridaben	Golden-Rain Tree ( <i>Koelreuteria bipinnata</i> )	16679A
• Pyridaben	Goldenrod ( <i>Solidago</i> )	16531A
• Pyridaben	Goldenrod ( <i>Solidago</i> )	16804A
• Pyridaben	Hakone Grass, Japanese Forest Grass ( <i>Hakonechloa</i> )	16552A
• Pyridaben	Hakone Grass, Japanese Forest Grass ( <i>Hakonechloa</i> )	16825A
• Pyridaben	Hardy Ice Plant ( <i>Delosperma nubigenum</i> )	16456A
• Pyridaben	Hardy Ice Plant ( <i>Delosperma nubigenum</i> )	16729A
• Pyridaben	Heath ( <i>Erica</i> )	16349A
• Pyridaben	Heath ( <i>Erica</i> )	16622A
• Pyridaben	Heather ( <i>Calluna</i> )	16337A
• Pyridaben	Heather ( <i>Calluna</i> )	16610A
• Pyridaben	Heavenly Bamboo ( <i>Nandina domestica</i> )	16370A
• Pyridaben	Heavenly Bamboo ( <i>Nandina domestica</i> )	16643A
• Pyridaben	Helen's Flower, Sneezeweed ( <i>Helenium</i> )	16482A
• Pyridaben	Helen's Flower, Sneezeweed ( <i>Helenium</i> )	16755A
• Pyridaben	Honey Locust ( <i>Gleditsia</i> )	16404A
• Pyridaben	Honey Locust ( <i>Gleditsia</i> )	16677A
• Pyridaben	Hornbean, European ( <i>Carpinus betulus</i> )	16396A
• Pyridaben	Hornbean, European ( <i>Carpinus betulus</i> )	16669A
• Pyridaben	Houseleek ( <i>Sempervivum</i> )	16530A
• Pyridaben	Houseleek ( <i>Sempervivum</i> )	16803A
• Pyridaben	Jacob's Ladder ( <i>Polemonium</i> )	16522A
• Pyridaben	Jacob's Ladder ( <i>Polemonium</i> )	16795A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Pyridaben	Japanese Cedar	16310A
	(Cryptomeria)	
• Pyridaben	Japanese Cedar	16583A
	(Cryptomeria)	
• Pyridaben	Japanese Kerria,	16361A
	Japanese Rose ( <i>Kerria japonica</i> )	
• Pyridaben	Japanese Kerria,	16634A
	Japanese Rose ( <i>Kerria japonica</i> )	
• Pyridaben	Japanese Pagoda Tree	16415A
	( <i>Sophora japonica</i> )	
• Pyridaben	Japanese Pagoda Tree	16688A
	( <i>Sophora japonica</i> )	
• Pyridaben	Japanese Plum Yew	16308A
	(Cephalotaxus)	
• Pyridaben	Japanese Plum Yew	16581A
	(Cephalotaxus)	
• Pyridaben	Japanese Zelkova	16418A
	( <i>Z. serrata</i> )	
• Pyridaben	Japanese Zelkova	16691A
	( <i>Z. serrata</i> )	
• Pyridaben	Kentucky Coffee Tree	16405A
	( <i>Gymnocladus dioica</i> )	
• Pyridaben	Kentucky Coffee Tree	16678A
	( <i>Gymnocladus dioica</i> )	
• Pyridaben	Larch (Larix)	16408A
• Pyridaben	Larch (Larix)	16681A
• Pyridaben	Larkspur (Delphinium)	16457A
• Pyridaben	Larkspur (Delphinium)	16730A
• Pyridaben	Laurel (Kalmia)	16297A
• Pyridaben	Laurel (Kalmia)	16570A
• Pyridaben	Lavender (Lavandula)	16497A
• Pyridaben	Lavender (Lavandula)	16770A
• Pyridaben	Leadwort ( <i>Ceratostigma plumbaginoides</i> )	16448A
• Pyridaben	Leadwort ( <i>Ceratostigma plumbaginoides</i> )	16721A
• Pyridaben	Leopards-Bane	16462A
	(Doronicum)	
• Pyridaben	Leopards-Bane	16735A
	(Doronicum)	
• Pyridaben	Lily-Of-The-Nile	16422A
	(Agapanthus)	
• Pyridaben	Lily-Of-The-Nile	16695A
	(Agapanthus)	
• Pyridaben	Lilyturf (Liriope)	16556A
• Pyridaben	Lilyturf (Liriope)	16829A
• Pyridaben	Linden, Basswood (Tilia)	16417A
• Pyridaben	Linden, Basswood (Tilia)	16690A
• Pyridaben	Lithodora	16502A
• Pyridaben	Lithodora	16775A
• Pyridaben	Locust, Black	16414A
	( <i>Robinia pseudoacacia</i> )	
• Pyridaben	Locust, Black	16687A
	( <i>Robinia pseudoacacia</i> )	
• Pyridaben	Loosestrife, Circle	16505A
	Flower (Lysimachia)	
• Pyridaben	Loosestrife, Circle	16778A
	Flower (Lysimachia)	
• Pyridaben	Lungwort (Pulmonaria)	16524A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Pyridaben	Lungwort (Pulmonaria)	16797A
• Pyridaben	Maidenhair Tree	16356A
	( <i>Ginkgo biloba</i> )	
• Pyridaben	Maidenhair Tree	16629A
	( <i>Ginkgo biloba</i> )	
• Pyridaben	Mannagrass ( <i>Glyceria fluitans</i> )	16554A
• Pyridaben	Mannagrass ( <i>Glyceria fluitans</i> )	16827A
• Pyridaben	Maple (Acer)	16601A
• Pyridaben	Michaelmas Daisy	16436A
	(Aster)	
• Pyridaben	Michaelmas Daisy	16709A
	(Aster)	
• Pyridaben	Mondo Grass, Lilyturf, Ker-Gawl (Ophiopogon)	16558A
• Pyridaben	Mondo Grass, Lilyturf, Ker-Gawl (Ophiopogon)	16831A
• Pyridaben	Monkshood, Aconite	16420A
	(Aconitum)	
• Pyridaben	Monkshood, Aconite	16693A
	(Aconitum)	
• Pyridaben	Montebretia (Crocasmia)	16454A
• Pyridaben	Montebretia (Crocasmia)	16727A
• Pyridaben	Mountain Ash (Sorbus)	16416A
• Pyridaben	Mountain Ash (Sorbus)	16689A
• Pyridaben	Mullein (Verbascum)	16541A
• Pyridaben	Mullein (Verbascum)	16814A
• Pyridaben	Nipponantherum	16510A
• Pyridaben	Nipponantherum	16783A
• Pyridaben	Oat Grass (Helictotrichon)	16553A
• Pyridaben	Oat Grass (Helictotrichon)	16826A
• Pyridaben	Pampas Grass (Cortaderia)	16549A
• Pyridaben	Pampas Grass (Cortaderia)	16822A
• Pyridaben	Phlox, Variegated (Phlox x procumbens foliovariegated)	16518A
• Pyridaben	Phlox, Variegated (Phlox x procumbens foliovariegated)	16791A
• Pyridaben	Pincushion Flower	16801A
	(Scabiosa)	
• Pyridaben	Pine, Jap.Umbrella	16320A
	( <i>Sciadopitys verticillata</i> )	
• Pyridaben	Pine, Jap.Umbrella	16593A
	( <i>Sciadopitys verticillata</i> )	
• Pyridaben	Pine, White ( <i>Pinus strobus</i> )	19159A
• Pyridaben	Plume Grass; Ravenna	16550A
	(Erianthus)	
• Pyridaben	Plume Grass; Ravenna	16823A
	(Erianthus)	
• Pyridaben	Queen-Of-The-Prairie, Meadowsweet (Filipendula)	16473A
• Pyridaben	Queen-Of-The-Prairie, Meadowsweet (Filipendula)	16746A
• Pyridaben	Red Bud, Eastern	16397A
	( <i>Cercis canadensis</i> )	
• Pyridaben	Red Bud, Eastern	16670A
	( <i>Cercis canadensis</i> )	
• Pyridaben	Reubellum	16525A
• Pyridaben	Reubellum	16798A
• Pyridaben	Rock Cress (Aubrieta)	16438A
• Pyridaben	Rock Cress (Aubrieta)	16711A



<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Pyridaben	Russian Arborvitae (Microbiota)	16315A
• Pyridaben	Russian Arborvitae (Microbiota)	16588A
• Pyridaben	Russian Olive ( <i>Elaeagnus angustifolia</i> )	16348A
• Pyridaben	Russian Olive ( <i>Elaeagnus angustifolia</i> )	16621A
• Pyridaben	Russian Porcelain (Ampelopsis)	16388A
• Pyridaben	Russian Porcelain (Ampelopsis)	16661A
• Pyridaben	Sage, Jerusalem ( <i>Phlomis fruticosa</i> )	16517A
• Pyridaben	Sage, Jerusalem ( <i>Phlomis fruticosa</i> )	16790A
• Pyridaben	Sage, Ramona (Salvia x sylvestris)	16527A
• Pyridaben	Sage, Ramona (Salvia x sylvestris)	16800A
• Pyridaben	Sage, Russian; Blue Spire (Perovskia)	16788A
• Pyridaben	Sandwort (Arenaria)	16432A
• Pyridaben	Sandwort (Arenaria)	16705A
• Pyridaben	Sea Pink, Thrift (Armeria)	16433A
• Pyridaben	Sea Pink, Thrift (Armeria)	16706A
• Pyridaben	Sedge (Carex)	16547A
• Pyridaben	Sedge (Carex)	16820A
• Pyridaben	Silver Grass (Miscanthus)	16830A
• Pyridaben	Silver Lace Vine ( <i>Polygonum aubertii</i> )	16394A
• Pyridaben	Silver Lace Vine ( <i>Polygonum aubertii</i> )	16667A
• Pyridaben	Solidaster ( <i>S. luteus</i> )	16532A
• Pyridaben	Solidaster ( <i>S. luteus</i> )	16805A
• Pyridaben	Spanish-Bayonet ( <i>Yucca aloifolia</i> )	16306A
• Pyridaben	Spanish-Bayonet ( <i>Yucca aloifolia</i> )	16579A
• Pyridaben	Speedwell, Brooklime (Veronica)	16816A
• Pyridaben	St.Daboec's Heath, Irish Heath ( <i>Daboecia</i> sp.)	16345A
• Pyridaben	St.Daboec's Heath, Irish Heath ( <i>Daboecia</i> sp.)	16618A
• Pyridaben	Stokes Aster (Stokesia)	16534A
• Pyridaben	Stokes Aster (Stokesia)	16807A
• Pyridaben	Strawberry (Non-Bearing) ( <i>Fragaria</i> sp.)	16474A
• Pyridaben	Strawberry (Non-Bearing) ( <i>Fragaria</i> sp.)	16747A
• Pyridaben	Summersweet ( <i>Clethra alnifolia</i> )	16341A
• Pyridaben	Summersweet ( <i>Clethra alnifolia</i> )	16614A
• Pyridaben	Sun Rose, Rock Rose (Helianthemum)	16483A
• Pyridaben	Sun Rose, Rock Rose (Helianthemum)	16756A
• Pyridaben	Sweet Woodruff ( <i>Galium odoratum</i> )	16476A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Pyridaben	Sweet Woodruff ( <i>Galium odoratum</i> )	16749A
• Pyridaben	Sweetshrub (Calycanthus)	16338A
• Pyridaben	Sweetshrub (Calycanthus)	16611A
• Pyridaben	Switch-Grass ( <i>Panicum virgatum</i> )	16559A
• Pyridaben	Switch-Grass ( <i>Panicum virgatum</i> )	16832A
• Pyridaben	Tansy, Sun Fern (Tanacetum)	16535A
• Pyridaben	Tansy, Sun Fern (Tanacetum)	16808A
• Pyridaben	Thyme (Non-Bearing) (Thymus)	16538A
• Pyridaben	Thyme (Non-Bearing) (Thymus)	16811A
• Pyridaben	Toad Lily (Tricyrtis)	16540A
• Pyridaben	Toad Lily (Tricyrtis)	16813A
• Pyridaben	Turtlehead, Snakehead (Chelone)	16722A
• Pyridaben	Valerian, Centranth (Centranthus)	16447A
• Pyridaben	Valerian, Centranth (Centranthus)	16720A
• Pyridaben	Virginia Sweetspire ( <i>Itea virginica</i> )	16360A
• Pyridaben	Virginia Sweetspire ( <i>Itea virginica</i> )	16633A
• Pyridaben	Wall Germander (Teucrium)	16536A
• Pyridaben	Wall Germander (Teucrium)	16809A
• Pyridaben	Wild Oats ( <i>Chasmanthium latifolium</i> )	16548A
• Pyridaben	Wild Oats ( <i>Chasmanthium latifolium</i> )	16821A
• Pyridaben	Windflower, Lily-Of-The-Field (Anemone)	16703A
• Pyridaben	Winter Hazel (Corylopsis)	16400A
• Pyridaben	Winter Hazel (Corylopsis)	16673A
• Pyridaben	Woadwaxen, Dyers Greenweed ( <i>Genista tinctoria</i> )	16355A
• Pyridaben	Woadwaxen, Dyers Greenweed ( <i>Genista tinctoria</i> )	16628A
• Pyridaben	Yarrow ( <i>Achillea millefolium</i> )	16419A
• Pyridaben	Yarrow ( <i>Achillea millefolium</i> )	16692A
• Pyridaben	Yellow Archangel ( <i>Lamiaeum galeobdolon</i> )	16494A
• Pyridaben	Yellow Archangel ( <i>Lamiaeum galeobdolon</i> )	16767A
• Pyridaben	Yellow Foxtail (Alopecurus)	16545A
• Pyridaben	Yellow Foxtail (Alopecurus)	16818A
• Pyridaben	Yellowwood (Cladrastis)	16399A
• Pyridaben	Yellowwood (Cladrastis)	16672A
• S-Metolachlor	Ash, Green ( <i>Fraxinus pennsylvanica</i> )	21421A
• S-Metolachlor	Cosmos	13128A
• S-Metolachlor	Dogwood, Red Osier ( <i>Cornus sericea</i> )	21420A
• S-Metolachlor	Dogwood, Silky ( <i>Cornus amomum</i> )	21419A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• S-Metolachlor	Oak, Red ( <i>Quercus rubra</i> )	21423A
• Thiamethoxam	Arborvitae (Thuja)	20951A
• Thiamethoxam	Arborvitae (Thuja)	20961A
• Thiamethoxam	Barberry (Berberis)	21136A
• Thiamethoxam	Boxwood (Buxus)	21138A
• Thiamethoxam	Butterfly Bush ( <i>Buddleia davidii</i> )	21133A
• Thiamethoxam	Butterfly Bush ( <i>Buddleia davidii</i> )	21162A
• Thiamethoxam	Canna	21157A
• Thiamethoxam	Coneflower (Rudbeckia)	21156A
• Thiamethoxam	Dogwood, Flowering ( <i>Cornus florida</i> )	21160A
• Thiamethoxam	Fountain Grass ( <i>Pennisetum setaceum</i> )	23155A
• Thiamethoxam	Hibiscus	21161A
• Thiamethoxam	Holly (Ilex)	21142A
• Thiamethoxam	Hydrangea	21140A
• Thiamethoxam	Juniper (Juniperus)	21141A
• Thiamethoxam	Lilac (Syringa)	21144A
• Thiamethoxam	Marsh Mallow (Althaea)	21135A
• Thiamethoxam	Pine, Austrian ( <i>Pinus nigra</i> )	20954A
• Thiamethoxam	Pine, Mugo & Mugho ( <i>Pinus mugo</i> )	21117A
• Thiamethoxam	Pine, Scotch ( <i>Pinus sylvestris</i> )	20953A
• Thiamethoxam	Pine, White ( <i>Pinus strobus</i> )	20955A
• Thiamethoxam	Privet (Ligustrum)	21145A
• Thiamethoxam	Purpleleaf Wintercreeper ( <i>Euonymus radicans</i> )	20952A

<b>Pest Control Agent</b>	<b>Commodity</b>	<b>PR#</b>
• Thiamethoxam	Reed Grass ( <i>Calamagrostis arundinacea</i> )	23153A
• Thiamethoxam	Rhododendron	21119A
• Thiamethoxam	Ribbon-Grass, Gardeners- Garters ( <i>Phalaris arundinacea</i> )	23156A
• Thiamethoxam	Sage (Salvia x sylvestris)	23157A
• Thiamethoxam	Shasta Daisy ( <i>Chrysanthemum x superbum</i> )	21150A
• Thiamethoxam	Silver Grass (Miscanthus)	23154A
• Thiamethoxam	Spirea (Spiraea)	21151A
• Thiamethoxam	Spruce, Black ( <i>Picea mariana</i> )	20959A
• Thiamethoxam	Spruce, Colorado ( <i>Picea pungens</i> )	20957A
• Thiamethoxam	Spruce, Serbian ( <i>Picea omorika</i> )	20956A
• Thiamethoxam	Spruce, White; Cat ( <i>Picea glauca</i> )	20958A
• Thiamethoxam	Viburnum ( <i>Viburnum suspensum</i> )	21123A
• Thiamethoxam	Viburnum ( <i>Viburnum suspensum</i> )	21152A
• Thiamethoxam	Weigela	21153A
• Thiamethoxam	Willow (Salix)	21155A
• Thiamethoxam	Yew (Taxus)	20970A
• Thiophanate Methyl	Pine, White ( <i>Pinus strobus</i> )	11579A
• Trifloxystrobin	Sage, Ramona (Salvia x sylvestris)	14527A
• Trifloxystrobin	Sage, Ramona (Salvia x sylvestris)	14800A

## Attachment 9

### **Biopesticide Research and Development – 2003**

#### IR-4 petitions/petition amendments submitted

0052B *Aspergillus flavus* AF36/ Cotton Amendment

0160B Thymol/Beehives (Section 18 PA, CT, MO, MI, IA, MA, IL, NE, OK, VT, ND, IN, ME, MN, MI, SC, UT, FL)

0086B *Verticillium dahliae* WCS 850/American elm EUP extension

0094B *Chondrosterum purpureum*/Forestry Amendment

0142B *Reynoutria sachalinensis*/All food commodities

#### Biopesticide Clearances 2003

#### Clearances from IR-4 Petitions

0052B *Aspergillus flavus* AF36/ Cotton Arizona and Texas

0160B Thymol/Beehives (Section 18 PA, CT, MO, MI, IA, MA, IL, NE, OK, VT, ND, IN, ME, MN, MI, SC, UT, FL)

0086B *Verticillium dahliae* WCS 850/American elm EUP extension

#### New clearances supported by IR-4 Biopesticide Grant Program efficacy research funds

0288B *Bacillus licheniformis* SB3086- Ornamentals

0004B *Metarhizium anisopiliae* strain F52 –Ornamentals

# **IR-4**

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IR-4 Project  
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North Brunswick, NJ 08902-3390

01/04