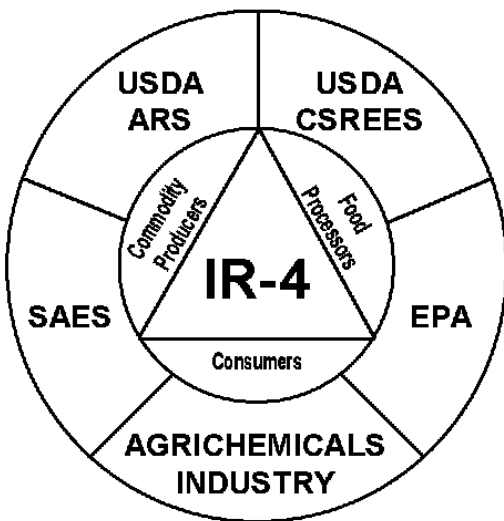

ANNUAL REPORT 2002



**A NATIONAL AGRICULTURAL
PROGRAM TO CLEAR CROP
PROTECTION CHEMICALS AND
BIOLOGICAL PEST CONTROL
AGENTS FOR MINOR USE**

INTERREGIONAL RESEARCH PROJECT NO. 4



University of California • Cornell University •
University of Florida • Michigan State University

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS

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

January 1, 2002 - December 31, 2002

INTRODUCTION

BACKGROUND

The Interregional Research Project No. 4 (IR-4 Project) was organized 39 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 minor 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 2002, the program scheduled 134 projects with 682 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 or 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 minor crop agriculture. These products were 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 three 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 this past year. 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 minor crops. The impact of the cumulative risk assessment on the organophosphorous insecticides will likely impose additional minor crop label restrictions. Fortunately, the EPA has worked closely with minor 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. IR-4 strongly believes that the projects now underway and the petitions that were submitted since 2000 and will be submitted in the upcoming years will provide minor crop growers with safe and effective crop protection tools.

Ornamentals Program

The ornamental industry is an extremely important component of minor crop agriculture with over \$12 billion in annual sales which comprise over 25% of all minor 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 initiate foliar dislodgeable residue studies to provide accurate data for the Agencies worker exposure risk assessments.

FUTURE DIRECTIONS

The last two years have given IR-4 an opportunity to observe our progress in implementing the 2001 to 2005 Strategic Plan which was approved by the Project Management Committee in 2000. It is important that we continue to focus our efforts on the Mission Statement ("To provide pest management solutions to growers of fruits, vegetables and the other minor crops. People who benefit from IR-4 are consumers, growers and food processors") developed as a key part of the Strategic Plan. The cornerstone of the Plan is to focus on the latest crop protection chemistries and biopesticides as solutions for the pest control needs of minor 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 second 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 2002 Workplan was comprised of 50% of our projects and this will continue on their 2003 Workplan. We can hardly ask more of the Agency and greatly appreciate this level of support and cooperation for minor 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 continues 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 minor crops since 2003 will restrict the level of methyl bromide useage by 70%. 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 USDA funding in a \$335,000 two-year grant for the cut flowers and bulb 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 39 projects for \$300,000 and amounting to nearly \$2,100,000 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 industries 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 2002 Annual Report highlights the progress of IR-4 toward achieving the goal of providing safe and effective chemical and biopesticide options for minor crop growers which are compatible with IPM programs. The accomplishments, as measured by clearances, were the third highest on record with 531 food use clearances including 91 biopesticides food use clearances (compared to the record of 567 in 2000) along with 482 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, 2002 to December 31, 2002.

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 8824 IR-4 food-use requests, an increase of 359 over the 8465 requests reported in 2001. Of these, 824 are researchable projects. In 2002, SAES and USDA-ARS cooperators scheduled research on 134 requested clearance projects (studies) which represented 682 field trials. Residue samples from 579 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 2002 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 minor crop growers. One hundred and thirty-nine permanent tolerances, exemptions, or temporary tolerances were established in 2002 based on IR-4 data. These tolerances support 531 new minor uses that can be added to crop protection chemical labels (Attachment 4). These new uses reflect EPA work on 38 various products. California Department of Pesticide Regulation (DPR) continues to provide support to the workshare program and many of these new uses (nearly 20%) were a result of DPR's review of residue chemistry data for EPA.

IR-4 data from traditional chemical products resulted in 388 new uses that can be added to product labels. These uses are based on EPA granting 107 tolerances on 21 products. In some cases, as many as twenty new uses were granted for a single submission (i.e. halosulfuron on dry beans, or spinosad on radish, see Attachment 4). IR-4 data were used to support 91 new biopesticide food uses in 2002. These include sucrose octanoate (esters) use on a wide number of fruit, vegetable and row crops and *Aspergillus flavus* AF-36 for use in cotton.

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 Section 18 time-limited tolerances were established based on IR-4 data. These Section 18 tolerances supported 52 minor crop uses that in many cases these tolerances support uses in multiple states. This number is considerably lower than 2001, which is likely due to IR-4 data supporting permanent tolerances, thus reducing the number of Section 18's needed. EPA reported that tolerances granted for IR-4 submission in 2002 addressed a total of 56 Section 18's that would no longer be required.

In summary, the total new food use clearances supported by IR-4 research in 2002 include: 388 new chemical clearances, 91 new biopesticide clearances and 52 Section 18 uses for a total of 531 uses.

Crop Group Definitions

IR-4 submitted a crop group petition that was approved in 2002 to include rapeseed, Indian rapeseed, Indian mustard, field mustard, black mustard, flax, sunflower, safflower and crambe in a new Oilseed

Crop Group 20. This action was approved by EPA-HED-ChemSAC on June 24th. Information on the IR-4/EPA International Crop Grouping Symposium is shown in Attachment 5.

REGULATORY PROGRESS

IR-4's partnership with EPA continues to grow and foster new avenues to registration. For example, the thiophanate-methyl registrations for canola, pistachio, and potato were the result of cooperative efforts between EPA's Registration and Special Review and Reregistration Divisions. Items such as the "Super Crop Group Strategies" continue to result in new uses for ultra minor crops such as the tropical fruits, (see pyriproxyfen registrations in Attachment 4). 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 2003 Work Plan expects to yield even higher results compared to 2002 with IR-4 having over 50% of EPA projects for new uses on already registered products, which should again result in over 500 new clearances. IR-4 had personnel exchange with the Biopesticide Pollution and Prevention Division in order seek out additional efficiencies in the area of biopesticide petition review and registration. EPA's "Workshare Program" with the California Department of Pesticide Regulation (CDPR) continues to be extremely productive with over 60 of the new uses resulting from data packages reviewed by CDPR. The first EPA/Canada Pest Management Regulatory Agency (PMRA) Joint Review of an IR-4 petition was a success as fenhexamid was registered for use on raspberry in both the US and Canada this past spring.

Data Package Development

IR-4 submitted 150 data packages to EPA in 2002 (see Attachment 6) which was a 30% increase over the number submitted in 2001. This was the result of a lot of hard work by IR-4 personnel at all levels (Field, Laboratory, QA, Regional and Headquarters offices). It also illustrates IR-4's strong commitment to the 30-month timeline and to scheduled submissions with EPA. The current number of projects in line for report writing is 238 (see Attachment 7).

ORNAMENTAL RESEARCH AND REGISTRATIONS

Since the IR-4 Ornamentals Program was initiated in 1977, a total of 24,082 ornamental pest control clearance requests have been received. There are now 5936 researchable projects still requiring research data. Requests for 2624 of these projects were received during 2002. IR-4 supported 650 ornamental research trials during 2002 and prepared 39 registration packages containing 539 reports that were sent to registrants for use in future label registrations. These included 15 fungicide, 9 herbicide, 8 insecticide, 1 molluscicide and 7 plant growth regulator packages. Two biofungicides were also included among these data packages. These research data are used for national label registrations for floral, forestry, nursery, Christmas tree and turf production. Data were also provided for use in the maintenance of commercial landscape, interior plantscapes, and for use in plant propagation. During the year, industry labeled 482 ornamental uses based on IR-4 data. These are shown in Attachment 8.

BIOPESTICIDE RESEARCH AND REGISTRATIONS

In 2002, the following biopesticide research projects were funded: Management of oriental beetle *Exomala orientalis* by pheromone-mediated disruption in multiple crops; Efficacy studies to support registration of super fluid extracted sagebrush; Evaluation of BioYield for plant growth promotion and disease control in various ornamental crops; Integration of solid matrix priming and plant growth promoting rhizobacteria to improve germination; Early plant development and control of damping off diseases in sweet corn in cold soils; Efficacy of *Trichoderma hamatum* T10 for control of strawberry black root rot; Evaluation of BioYield for induced systemic resistance against foliar pathogens of watermelon and cantaloupe; Management of root-knot nematode diseases in tomato, cucumber, and pepper under field conditions with a biological stimulant ACE; Lactosan fungicidal efficacy on grapes and blueberries; Efficacy and health effects of formic acid MiteAway pads on parasitic mites in honey

bees; Mating disruption of codling moth and oriental fruit moth in apple using Isomate CM/OFM hand applied dispenser technology; Mating disruption of codling moth in apple using microencapsulated sprayable pheromone; Evaluation of Milsana for control of powdery mildew of lettuce; Field evaluation of a pollinator-delivered biological control against mummy berry disease of blueberry; Disease control in ornamental crops with biopesticides and fungicides; Milsana for control of powdery mildew of roses; Plantshield for control of black root rot in strawberries; Effect of Auxigro on broccoli yields; Mycostop for control of black root rot in strawberries; Primastop for control of black root rot in strawberries; Evaluation of Contans for control of Sclerotinia leaf drop of lettuce; Biological control of *Sclerotinia sclerotiorum* using Contans, a formulation of *Coniothyrium minitans*; Integration of biocontrol measures for management of peach rusty spot; Serenade for control of mummy berry disease in blueberries; FNX-100 (dipotassium phosphate & dipotassium phosphonate) natural compound; Greenhouse evaluation of biopesticides for control of *Phytophthora* diseases of vegetables and ornamentals; Evaluation of Milsana for control of powdery mildew of cantaloupe; Evaluation of biologically based and chemically based strategies to reduce root rot of strawberry plug plants; Evaluation of AtEze on transplant quality, disease suppression and yield on field grown fresh market tomatoes and bell peppers in Southwest Florida; Milsana (new calcium nitrate formulation) on peppers for powdery mildew control; Milsana (new calcium nitrate formulation) on squash and/or cucumbers for powdery mildew control; Potential for management of Sclerotinia blight with the biological control agent *Coniothyrium minitans* (Contans); Serenade for control of fruit rot in cranberries; Evaluation of a bio-herbicide for *Stevia rebaudiana* Bertoni; Field testing of BioPhos as a component in an Integrated Pest Management Strategy for fresh market tomatoes; Serenade WP on spinach white rust; Serenade WP on *Alternaria* and downy mildew of turnip greens; Serenade WP on *Alternaria* leaf spot in cabbage; and Serenade AQ on bean rust.

In 2002, 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

IR-4's Methyl Bromide Alternatives Program in 2002 included four large scale, company-sponsored trials in strawberries and four in fresh market tomatoes. These trials were located in the major production areas of California and Florida. There were two trials on each crop in each state for a total of eight large scale trials. Data from these trials are being used by the sponsoring companies in registration decisions and will also be used to help the companies achieve official methyl bromide replacement status for fast track regulatory decisions by the EPA's Registration Division. Products given this status as a result of the IR-4 MBA program include Midas (iodomethane), Basamid (dazomet), fosfiazate, halosulfuron methyl, and trifloxysulfuron sodium. As a consequence, EPA expects to render registration decisions on these products early in 2003. Other products being considered for nonimposition of official methyl bromide replacement status include MULTIGUARDTMFFA, MULTIGUARDTMPROTECT, and propylene oxide.

New product entries into IR-4's large-scale MBA program in 2002 included SEP-100 from American Pacific Corporation, Syngenta's trifloxysulfuron sodium in fresh market tomatoes, and a biological products from Crompton-Uniroyal Chemical, UCC-A1641. Ajay North America discontinued evaluations in IR-4's strawberry program but continued with evaluations in fresh market tomatoes, a crop with great crop tolerance.

In 2002, IR-4's MBA program was expanded to include cucurbit vegetables (summer squash) in Michigan and much larger programs in terms of products under evaluation in cut flowers and ornamental bulbs. The cut flower/bulb crop trials were run in California and Florida and some will continue in 2003. Products showing promise in the summer squash trial in Michigan are the MULTIGUARDTM products. The primary pest problem in the Michigan test was a strain of *Phytophthora capsici* resistant to all currently available foliar fungicides. In cut flowers and bulb crops, the MULTIGUARDTM products and propylene oxide showed varying degrees of promise. These products have shown most promise against soil borne fungal pathogens, nematodes and some of the small seeded weeds like *Amaranthus* species and

Poa annua. Propylene oxide gave good control of *Byperus* species in *Gladiolus* bulbs in Florida but the MULTIGUARD™ products only gave about 40% suppression of these difficult weed species.

In 2002, IR-4 became directly involved in the decision making process for Critical Use Exemptions (CUEs) to permit the continued use of methyl bromide in minor crops after the 2005 phase out date. IR-4 is represented on a review panel responsible for advancing nominations for CUE's to the international community through US MBTOC members. A total of 56 CUE applications were received by EPA from various minor crop commodity organizations and IR-4 was responsible for the secondary biological reviews of all of them and the primary reviews of several.

Plans in 2003 are to continue with the large-scale programs in tomatoes and strawberries to the extent of company interest and to expand evaluations into other crops, including possibly woody ornamental plant beds. Time will also be given to assisting interested university researchers in the preparation and submission of cut flower, cucurbit vegetable, and possibly other mulched vegetable grant proposals for funding by USDA-CSREES.

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 five US EPA GLP compliance inspections. Four 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 41 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 Project Management Committee (PMC) of the IR-4 Project scheduled a review of the IR-4 QA program to make an assessment of its strengths, weaknesses and areas where improvements can be made. The team was led by Dr. Willis Wheeler, Dr. Paul Schwartz of the USDA-ARS, Dr. Ken Kanagalingam (a QA consultant formerly with the US EPA's Laboratory Data Integrity Branch) and Dr. Wynn John of DuPont Crop Protection, Residue Programs Manager made up the review team. The review was held at IR-4 Headquarters on October 19-21, 2002. HQ QA staff and Study Directors were interviewed directly and Regional QA Coordinators, Test Site QA members, Regional Field and Laboratory Coordinators and a group of Field Research Directors via teleconferences. The results, findings and recommendations of this review will reported to the PMC. The IR-4 QAU thanks the review team for their assistance in this matter and looks forward to their recommendations on how the IR-4 QA Unit can better function in the IR-4's overall GLP compliance program.

The IR-4 QAU is a cooperative unit in which representatives mutually monitor studies and coordinate activities in an efficient manner. In 2002, regular inspections included 28 facility inspections, more than 158 field in-life inspections, 80 analytical in-life inspections, 88 analytical summary report/data audits and 542 field data book audits. There were over 94 final reports completed during the 2002 calendar year and a total of 85 final reports audited.

PROGRAM COOPERATION AND COORDINATION

The IR-4 Project continued 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 minor 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 minor 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 (Aventis CropScience, American Cyanamid, Agr Evo, Astra Zeneca, Rhone-Poulenc, Merck, Rohm and Haas, Novartis, Sandoz and Zeneca) since 1996. In spite of these mergers, acquisitions and reorganizations as the result of the changes, the industry has continued to work closely with IR-4 to develop minor crop strategies for their new products. Our focus this past year has been to reestablish good working relationships with the newly merged companies at both the senior management and technical staff levels. We continued to work closely with all companies to maximize the potential of their new technologies for minor crops and make them aware of market opportunities as presented by our stakeholders through Project Clearance Requests and other direct inputs. An initiative started in 2002, which should pay big dividends in future years, was to share future petition submission strategies with registrants and to encourage them to disclose their EPA petition priorities to IR-4. This allows our Registration Team to prioritize and optimize with the EPA a maximum number of petitions (both IR-4 and registrant) around each active ingredient resulting in the best possible outcome for all partners (EPA, registrants and growers).
- **EPA.** The Technical Working Group (TWG) partnership started with the EPA in 1999 completed its fourth successful year with four meetings (16 total since 1999) and an IR-4 sponsored minor crop tour (5 total since 1999). The sabbatical completed by Dan Kunkel, Registration Manager, with the EPA in 2001 continued to pay big dividends in being able to work more closely with Hoyt Jamerson, Minor Use Officer, to develop the Agencies Annual Work Plan. This effort started early in 2002 and evolved over an 8 or 9 month period resulting in 50% of the EPA's 2003 Work Plan involving new uses for existing products with IR-4 projects. Of the 54 products that are currently registered and are on the 2003 EPA Workplan for new uses (label expansion), IR-4 is the sole submitter on 20 and is the joint petitioner with the registrants on another 17 active ingredients. IR-4's involvement with 68.5% of the products on the EPA's 2003 Work Plan is a good example of the scope of the program. In addition, IR-4 is sole crop submitter on one new active ingredient (quinoxifen) included in the 19 on the 2003 Work Plan and has ongoing research work on another 12 active ingredients resulting in a 63% involvement by IR-4 in the new products being registered by the EPA. A partnership initiative started with the Biopesticide and Pollution Prevention Division (BPPD) in 2001 was expanded this past year with three IR-4/BPPD Technical Working Group Meetings to explore more efficient ways to improve biopesticide registrations. Michael Braverman, IR-4 Biopesticide Coordinator who assumed this position from Bill Biehn who retired in January, completed a sabbatical with BPPD and has submitted a report with recommendations on steps IR-4 can take with BPPD to improve the review process and petition quality.
- **California's Department of Pesticide Regulation (DPR).** The EPA/IR-4/DPR partnership which was initiated in 2000 with one IR-4 petition as part of a DPR workshare program with the EPA continued in 2002 at the 2001 level with 30 IR-4 petitions. This workshare project involves about 10% of the EPA's annual workload of new uses for currently registered products and are about 20% of the IR-4 petitions submitted at the Agency. This program has been the major contributing factor in doubling the IR-4 contributions to the EPA's Work Plan from 25% in 2000 to 50% in 2002. The DPR Team has committed to maintain the current level of petition workshare support in 2003 in spite of severe budget cutbacks in California and at DPR. We greatly appreciate the support from Paul

Helliker, DPR Director, and his management team to continue this important program which greatly benefits not only California minor crop growers but also their counterparts throughout the U.S. Special thanks go to Roberta Firoved who supervised this program in DPR since its inception and to David Supkoff who will provide management oversight in 2003.

- **Health Canada's Pest Management Regulatory Agency (PMRA)**. PMRA completed its first IR-4 workshare petition with the EPA in 2002 and we look forward to expanding that cooperation in 2003 and subsequent years. The Canadians have been partners with IR-4 since 1996 and have made major contributions by conducting over 90 field residue trials on our priority projects since then. The Canadian government made a major funding commitment to minor crop growers in 2002 through PMRA and Agriculture and Agri-Food Canada which will set up 10 Field Research Centers, several GLP Residue Laboratories and a Minor Use Center in addition to expanding the PMRA minor crop review capabilities including Imme Gerke as the Minor Use Advisor. This commitment has allowed the Canadian Team to volunteer for 67 field residue trials in 2003 as part of our prioritization program and should lead to more minor crop registration for both U.S. and Canadian minor crop growers resulting in fewer trade irritant issues.
- **Commodity Liaison Committee (CLC)**. The CLC under the strong leadership of Chair Rocky Lundy, Executive Director of the Mint Industry Research Council, continues to provide direct input into our program and strategies through active participation by Rocky on the Project Management Committee (PMC) as well as through the Food Use and Ornamental Workshops. The CLC held a Congressional Staff Luncheon as a part of the February PMC meeting in Washington, D.C. to personally express to key House and Senate Agriculture Appropriations staff members the importance of minor crops to agriculture in their states and the critical importance of IR-4 in providing crop protection tools to them. The CLC efforts in the 2001 led directly to the approval of increases in both the CSREES and ARS minor crop/IR-4 budgets. This funding increase allowed IR-4 to increase support for field residue projects, increase funding for the Biopesticide and Ornamental Programs and purchase much needed new analytical instrumentation and field equipment to conduct the GLP residue trials.
- **Workshops**. As noted in the Introduction, The Food Use and Ornamental Workshops are very important for the program to be able to respond to the most critical pest control needs of our stakeholders. The Ornamental Workshop was held on April 15th to 18th in Austin, TX after being postponed from late September 2001 due to the 9/11 tragedy. The meeting was well attended by over 100 stakeholders who prioritized the most important ornamental pest control needs. The Food Use Workshop was held in Orlando, FL from September 17th to 19th with a record 200 plus attendance.

USEFULNESS OF FINDINGS

IR-4 goes through an extensive process each year to obtain input on the most critical pest control needs of minor 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 minor crop pest control solutions. All IR-4 food use residue research is carried out by EPA approved Good Laboratory Practices (GLP's) with coordination and implementation by the Quality Assurance Unit (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 crops protection chemicals and biological alternatives would be available for use on minor crops today.

WORK PLANNED FOR 2003

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 minor use needs. Established partnerships will be enhanced while new partnerships will be sought.

The research program for year 2003 will consist of approximately 96 studies supported by 662 field trials requiring the collection of residue samples. Additional trials will be for collecting efficacy and/or crop safety data to support specific data needs. Five hundred and thirty-four of the field trials (534) will be conducted by regional state agricultural research stations, while USDA-ARS will be conducting 69 field trials and Canada has agreed to cooperate on 67 trials. IR-4 is looking forward to another productive research season in 2003.

IR-4 will continue its commitment to producing quality scientific data in order to meet EPA's Good Laboratory Practice 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 February 25-26, 2003 in Washington, DC to conduct the annual QA scheduling 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 2003.

For the 2003 Biopesticide Research Program funding year, IR-4 received 108 proposals requesting \$1,245,726. Out of the 108 proposals, 29 were early stage and 79 were advanced stage proposals. The proposals include 53 for disease management, 8 for nematode control, 23 entomology projects, 7 pheromone projects, 16 involving plant growth regulators, and one weed control project. Funding decisions will be made in February 2003 and announced in March 2003 to utilize the \$400,000 budget.

Company-sponsored Methyl Bromide Alternative (MBA) Programs will continue in strawberries and fresh market tomatoes in 2003 marking the fifth continuous year that these programs have been run in California and Florida. MBA programs will also continue in cucurbit vegetables in Michigan for the second year and expand into other states where this use of methyl bromide is common practice in cucurbits. Additionally, the IR-4 MBA program will continue with evaluations in green peppers in Florida and in cut flowers and ornamental bulb crops in Florida and in California. Another important role to be played by IR-4 in 2003 and in the succeeding years will be to support commodity organizations when justified in obtaining Critical Use Exemptions (CUE's) to allow the continued use of methyl bromide to protect their crops until economically and biologically viable methyl bromide replacements can be developed and registered. IR-4 will continue to work in partnership with the US EPA and USDA in this role as well as in an advisory capacity on products where official methyl bromide alternative status should be given for fast track registration decisions. An objective will be to advance at least three new products to this status in 2003 (MULTIGUARD™, Propylene Oxide, and Sodium Azide).

Ornamental protocols have been developed for 117 chemicals and biopesticides. They include 43 fungicides, 38 herbicides, 24 insecticides, 1 nematocide, and 11 plant growth regulators. Approximately 600 research trials are being scheduled to be conducted by 44 federal, state and private researchers in 23 states.

IMPACT

The successes/accomplishments of the Program have been measure by the food use and ornamentals clearances obtained as noted in the Food Use Regulatory Accomplishments and Ornamental Research and

Registration Sections, respectively. The Project Management Committee endorsed a program in 2000 to tally the economic benefits from state Section 18 requests that had been approved by the EPA which utilized IR-4 residue data to support the request. Sandy Perry, National Outreach Specialist, undertook this project with the cooperation and support of Hoyt Jamerson, EPA Minor Use Officer, who allowed Sandy access to EPA Section 18 files. States requesting Section 18's as emergency exemptions are required to provide the EPA with information and data on how the pest control product will be used, data about residue levels (provided by IR-4 when requested), health and environmental risks and economic impact if the current pest situation goes untreated. The Food Quality Protection Act requires the EPA to establish formal tolerances and in many cases the Agency utilizes IR-4 residue data from projects being completed to establish tolerances on minor crops. As reported in the Food Regulatory Accomplishments Section, 52 minor crop clearances were supported by IR-4 residue data in 2002. We have been unable to finalize the economic impact from these Section 18's for 2002, but the estimate was in excess of \$1.2 billion in 2001 from IR-4 supported 180 Section 18's which was 39% of all the Section 18's granted by the EPA that year and 67% of the minor crop Section 18's. The number of Section 18's granted in 2002 using IR-4 supporting residue data were lower than the 180 in 2001 due partly to the EPA's estimate that 56 were not required because new Section 3/full registration IR-4 approvals were granted in 2002 eliminating the need for states to request Section 18's. The economic impact review searched back to 1998 and discovered the following information by year (number of Section 18's and value): 1998 (103 worth \$476 million); 1999 (134 worth \$1,078 million); 2000 (152 worth \$1,166 million) and 2001 (180 worth \$1,235 million) giving a four year total of 569 Section 18's with an economic impact of nearly \$4 billion.

OVERALL SUMMARY

The 1996 and 2001 Strategic Plans developed by the Project Management Committee have proven to be quite visionary in their strategies and action plans to address the challenges brought about by the Food Quality Protection Act and the bounty of new pest control technologies (chemical and biological) discovered by the crop protection industry. The strategy implemented in 1999 to develop strategic partnerships with the crop protection industry, the regulatory agencies (EPA, CDPR and PMRA) and minor crop growers and their commodity organizations has led to a new era of crop protection tools available for use by minor crop growers. IR-4 has completed its third consecutive year with over 500 minor crop clearances involving over 100 different petitions as compared to the pre-FQPA level of 100 clearances a year. This kind of accomplishment was made possible by the dedication and teamwork from everyone internally, the IR-4 program in the land grant university system (regional teams of chemists, quality assurance specialists, field coordinators, field researchers and management) and the USDA (our CSREES funding partner and its management and our ARS team and their similar complement of skills to their land grant university counterparts) coordinated by a dedicated Headquarters staff. IR-4 prides itself as a model of interagency cooperation for a federally funded program with matching support from the land grant university system.

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December 31, 2001

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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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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

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Dr. N. Thompson, *University of Florida, Chair*

Representing

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

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Dr. R. Holm, *Rutgers University, Executive Director*
Mr. R. Lundy, *Mint Industry Research Council*
Dr. M. Marshall, *University of Florida*
Dr. M. Miller, *University of California, Davis (Apr-Dec)*
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Ms. P. Sarica, *Rutgers University, Executive Secretary (Jan-Jul)*
Dr. P. Schwartz, Jr., *U.S. Department of Agriculture*
Dr. T. Shibamoto, *University of California, Davis (Jan-Mar)*
Dr. D. Soderlund, *Cornell University, Geneva*
Dr. N. Thompson, *University of Florida*

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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 |
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| Mr. R. Olszack, <i>Tropical Fruit Growers of South Florida, Inc.</i> | Homestead, FL |
| Mr. M. Pitts, <i>Cranberry Institute</i> | East Wareham, MA |
| Mr. R. Ratto, <i>Ratto Brothers</i> | Modesto, CA |
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| Ms. L. Schmale, <i>Society of American Florists</i> | Alexandria, VA |
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ATTACHMENT 1 (Continued)

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| Dr. R. Bellinger | SC |
| Dr. C. Collison | MS |
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| Dr. R. Davis, USDA-ARS | GA |
| Mr. B. Fraelich, USDA-ARS | GA |
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| Dr. H. Harrison, USDA-ARS | SC |
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| Dr. A. Johnson, USDA-ARS | GA |
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| Dr. W. Nesmith | KY |
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ATTACHMENT 2

FIELD AND LABORATORY RESEARCH COOPERATORS - 2002

The IR-4 Project is grateful to the many agricultural scientists who participated in the field and laboratory research phases of the program in 2002. 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

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| Ms. E. Hitchner | NJ | Dr. D. Yarborough | ME |
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WESTERN REGION

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| Mr. B. Boutwell | CA | Dr. B. McReynolds | OR |
| Mr. D. Cervantes | ID | Mr. W. Meeks | ID |
| Mr. C. Cornwell | OR | Mr. M. Middleton | CA |
| Mr. J. DeFrancesco | OR | Mr. M. Miller | CA |
| Mr. D. Ennes | CA | Mr. T. Miller | WA |
| Mr. D. Galt | CA | Ms. M. Mitchell | CA |
| Mr. K. Hembree | CA | Mr. E. Morris | NM |

ATTACHMENT 2 (Continued)

WESTERN REGION (Continued)

| | | | |
|------------------|----|----------------|----|
| Mr. C. Oman | CO | Mr. M. Straugh | CA |
| Dr. B. Rodrigues | CA | Dr. D. Stoffel | CA |
| Mr. S. Scheufele | CA | Mr. R. Wight | WA |

USDA-ARS

| | | | |
|------------------|----|---------------|----|
| Ms. S. Benzen | CA | Ms. E. Pfiel | MD |
| Mr. L. Birch | WA | Mr. C. Tappan | OH |
| Mr. B. Fraelich | GA | Mr. T. Treat | WA |
| Mr. T. Hendricks | GA | Mr. T. Wixson | WA |
| Mr. D. McCommas | TX | | |

CANADA

| | | | |
|-----------------|----|-------------------|----|
| Ms. S. Bouffard | QC | Mr. B. Kerr | ON |
| Ms. V. Brookes | BC | Mr. G. O'Neill | ON |
| Mr. R. Grohs | ON | Mr. C. vandenBerg | BC |

2001 IR-4 Ornamental Researchers

NORTHCENTRAL REGION

| | |
|---------------|--------------|
| B.A. Anderson | OH, USDA-ARS |
| R.A. Cloyd | IL |
| T.W. Davis | MI |
| 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

| | |
|---------------|--------------|
| G.R. Bachman | TN |
| D.M. Benson | NC |
| M.A. Czarnota | GA |
| J.F. Derr | VA |
| G.R. Fain | MS |
| 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 |
| B.E. Whipker | NC |
| M.M. Wrenn | SC, USDA-ARS |

WESTERN REGION

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

ATTACHMENT 3

Food Use Research Projects - 2002

| CHEMICAL | COMMODITY | PR # | CHEMICAL | COMMODITY | PR # |
|-------------------------------|--------------------------------------|------|-------------------------------|------------------------------|------|
| • Abamectin | Pineapple | 8439 | • Cyprodinil + Fludioxonil | Strawberry | 6790 |
| • Acetamiprid | Tomato (GH) | 8354 | • Cyromazine | Bean (Snap) | 3909 |
| • AVG | Cherry | 8052 | • DCPA | Carrott | 8332 |
| • Azoxystrobin | Broccoli | 7096 | • DCPA | Spinach | 8333 |
| • Azoxystrobin | Chives | 7105 | • Deltamethrin | Flax | 7666 |
| • BAS 510 | Bean | 7924 | • Difenoconazole | Sweetpotato | 8464 |
| • BAS 510 | Lettuce (Head & Leaf) | 7933 | • Diflubenzuron | Barley, Wheat | 8024 |
| • BAS 510 | Tomato | 8126 | • Diflubenzuron | Peanut | 7737 |
| • BAS 516 | Avocado | 8446 | • Dimethenamid-P | Radish | 7695 |
| • BAS 516 | Blueberry | 8008 | • Dimethenamid-P | Squash | 6596 |
| • BAS 516 | Cabbage | 8093 | • Dimethomorph | Bean (Lima) | 7261 |
| • BAS 516 | Caneberry | 7930 | • Dimethomorph | Broccoli | 7199 |
| • BAS 516 | Carrott | 7925 | • Famoxadone + Cymoxanil | Onion (Dry Bulb & Green) | 8303 |
| • BAS 516 | Celeriac | 8362 | • Fenamidone | Sunflower | 7999 |
| • BAS 516 | Onion (Green & Dry Bulb) | 7920 | • Fenhexamid | Ginseng | 7846 |
| • BAS 516 | Stone Fruits (PH) | 7922 | • Fenhexamid | Lettuce (Head & Leaf) | 7854 |
| • BAS 516 | Strawberry | 7929 | • Fenhexamid | Pomegranate | 8007 |
| • BAS 516 | Turnip (Roots & Tops) | 7927 | • Fenpyroximate | Hops | 8087 |
| • Bifenazate | Bean (Succulent Shelled & Edible) | 8275 | • Fenpyroximate | Mint | 8452 |
| • Bifenazate | Pea (Succulent Shelled) | 8276 | • Fludioxonil | Pomegranate (PH) | 8085 |
| • Bifenazate | Potato | 8278 | • Flumioxazin | Bean (Dry) | 8058 |
| • Bifenthrin | Beet (Garden) | 7556 | • Flumioxazin | Garlic | 8055 |
| • Bifenthrin | Carrot | 7089 | • Flumioxazin | Strawberry (Annual) | 8063 |
| • Bifenthrin | Mayhaw | 7513 | • Glufosinate | Blueberry | 5291 |
| • Buprofezin | Cherry | 7250 | • Halosulfuron | Potato | 7281 |
| • Buprofezin | Papaya | 7024 | • Imidacloprid | Banana | 7333 |
| • Buprofezin | Plum | 7519 | • Imidacloprid | Pomegranate | 8254 |
| • Captan | Lettuce (Leaf) | 8447 | • Indoxacarb | Cherry, Sour | 7235 |
| • Captan | Tomato | 8448 | • Indoxacarb | Cranberry | 8127 |
| • Carfentrazone- ethyl | Pepper (Bell & Non- Bell) | 7959 | • Indoxacarb | Cucumber | 6985 |
| • Chlorothalonil | Horseradish | 2392 | • Indoxacarb | Mint | 8418 |
| • Chlorothalonil | Rhubarb | 5410 | • Indoxacarb | Pea (Southern) | 6984 |
| • Clethodim | Caneberry (Raspberry)) | 6060 | • MCPB | Mint | 4757 |
| • Clethodim | Pea (Succulent) | 5202 | • Mefenoxam | Bean (Snap) | 8371 |
| • Clomazone | Broccoli | 3569 | • Mefenoxam | Papaya | 8449 |
| • Clopyralid | Canola | 5125 | • Mefenoxam + Copper | Caneberry (Raspberry) | 1169 |
| • Clopyralid | Strawberry (Annual) | 8132 | • Methoxyfenozide | Bean (Dry Shelled) | 7530 |
| • Clopyralid | Swiss Chard | 5435 | • Methoxyfenozide | Grasses | 7524 |
| • Cyfluthrin | Corn (Sweet) | 6930 | • Milbemectin | Avocado | 8281 |
| • Cyprodinil + Fludioxonil | Onion (Green & Dry Bulb) | 5033 | • Milbemectin | Hops | 8450 |
| • Cyprodinil + Fludioxonil | Tomato | 8124 | • Milbemectin | Lychee | 8438 |
| | | | • Milsana | Cucurbits | 7329 |
| | | | • Myclobutanil | Pepper (Bell & Non- Bell) | 6070 |
| | | | • NAA | Orange | 6024 |
| | | | • Pronamide | Cranberry | 3152 |

| CHEMICAL | COMMODITY | PR # |
|------------------|--------------------------|-------------|
| • Pronamide | Dandelion | 3488 |
| • Pyraclostrobin | Beet (Garden) | 8541 |
| • Pyraclostrobin | Broccoli | 7493 |
| • Pyraclostrobin | Cabbage | 7494 |
| • Pyraclostrobin | Celery | 7642 |
| • Pyraclostrobin | Greens (Mustard) | 7595 |
| • Pyraclostrobin | Spinach | 7643 |
| • Pyraclostrobin | Squash (Summer) | 7627 |
| • Pyraclostrobin | Turnip Greens | 7594 |
| • Pyriproxyfen | Grape | 7232 |
| • Pyriproxyfen | Strawberry | 8106 |
| • Pyriproxyfen | Tomato | 7412 |
| • Quinoxyfen | Lettuce (Head & Leaf) | 8367 |
| • Quinoxyfen | Strawberry | 8382 |
| • S-Metholachlor | Beet (Garden) | 6629 |
| • S-Metholachlor | Cantaloup | 6178 |
| • S-Metolachlor | Squash (Winter) | 6630 |
| • Sethoxydim | Cucumber | 7344 |
| • Sethoxydim | Pepper (Bell & Non-Bell) | 7722 |
| • Spinosad | Coffee | 7331 |
| • Sulfentrazone | Apple | 7770 |
| • Sulfentrazone | Cantaloup | 8445 |
| • Sulfentrazone | Flax | 7584 |
| • Sulfentrazone | Greens (Mustard) | 7581 |
| • Sulfentrazone | Muskmelon | 7911 |
| • Sulfentrazone | Watermelon | 7917 |
| • Tebuconazole | Onion, Garlic | 8365 |
| • Tefluthrin | Sweetpotato | 8018 |
| • Thiacloprid | Blueberry | 7813 |

| CHEMICAL | COMMODITY | PR # |
|----------------------|------------------------|-------------|
| • Thiamethoxam | Artichoke | 8282 |
| • Thiamethoxam | Barley | 7746 |
| • Thiamethoxam | Caneberry | 8039 |
| • Thiamethoxam | Hops | 8451 |
| • Thiamethoxam | Pecan | 7587 |
| • Thiophanate Methyl | Blueberry | 8309 |
| • Thiophanate Methyl | Caneberry (Blackberry) | 5039 |
| • Thiophanate Methyl | Citrus | 8294 |
| • Thiophanate Methyl | Mushroom | 8289 |
| • Thiophanate Methyl | Pistachio | 8486 |
| • Trifloxystrobin | Asparagus | 8212 |
| • Trifloxystrobin | Radish | 8363 |
| • Uniconazole | Pepper (Bell) | 4595 |
| • Uniconazole | Tomato | 4597 |
| • Zoxamide | Greens (Mustard) | 7983 |

ATTACHMENT 4

New Tolerances and Approvals - 2002

| Approval Type Pesticide Type Chemical | Crop | PR # | Tolerances | New/Added Uses |
|---|------|------|------------|-------------------|
|---|------|------|------------|-------------------|

EUP

| |
|--------------|
| Biopesticide |
|--------------|

| | | | | |
|---------------------------------|--------|-----|---|---|
| <i>Aspergillus flavus</i> AF-36 | Cotton | 52B | 1 | 1 |
|---------------------------------|--------|-----|---|---|

Exemption from

| |
|----------------|
| Bird Repellent |
|----------------|

| | | | | |
|---------------------|--------------|------|---|---|
| Methyl Anthranilate | Corn (sweet) | 5030 | 1 | 1 |
| Methyl Anthranilate | Strawberry | 7790 | 1 | 1 |
| Methyl Anthranilate | Sunflower | 5031 | 1 | 1 |

Permanent

| |
|-----------|
| Fungicide |
|-----------|

| | | | | |
|--------------|--------------------------|------|---|---|
| Azoxystrobin | Caneberry | 6786 | 1 | 4 |
| Azoxystrobin | Cranberry | 6859 | 1 | 1 |
| Azoxystrobin | Pistachio | 6830 | 1 | 1 |
| Dimethomorph | Cantaloup | 6753 | 1 | 3 |
| Dimethomorph | Cucumber | 6754 | 1 | 5 |
| Dimethomorph | Hops | 6945 | 1 | 1 |
| Dimethomorph | Lettuce, head | 6382 | 1 | 1 |
| Dimethomorph | Lettuce, leaf | 6382 | 1 | 1 |
| Dimethomorph | Onion (dry bulb) | 7200 | 1 | 5 |
| Dimethomorph | Onion (green) | 7246 | 1 | 6 |
| Dimethomorph | Squash | 6751 | 1 | 6 |
| Fenhexamid | Blueberry | 6935 | 1 | 5 |
| Fenhexamid | Caneberry (Raspberry) | 6840 | 1 | 4 |
| Fenhexamid | Juneberry | | 1 | 1 |
| Fenhexamid | Lingonberry | | 1 | 1 |
| Fenhexamid | Pistachio | 7818 | 1 | 1 |
| Fenhexamid | Salal | | 1 | 1 |
| Fludioxonil | Blueberry | 6724 | 1 | 5 |
| Fludioxonil | Caneberry | 6838 | 1 | 4 |
| Fludioxonil | Cherry | 6933 | 1 | |
| Fludioxonil | Juneberry | | 1 | 1 |
| Fludioxonil | Lingonberry | | 1 | 1 |
| Fludioxonil | Peach | 6934 | 1 | 8 |
| Fludioxonil | Pistachio | 7336 | 1 | 1 |
| Fludioxonil | Plum | 6843 | 1 | |
| Fludioxonil | Salal | | 1 | 1 |
| Fludioxonil | Watercress | 6759 | 1 | 1 |
| Fosetyl-Al | Blueberry | 4937 | 1 | 5 |
| Fosetyl-Al | Citrus | 7761 | | |
| Fosetyl-Al | Juneberry | | 1 | 1 |
| Fosetyl-Al | Lingonberry | 6950 | 1 | 1 |

| Approval Type Pesticide Type Chemical | Crop | PR # | Tolerances | New/Added Uses |
|---|-----------------|------|------------|-------------------|
| Fosetyl-Al | Pea (succulent) | 7570 | 1 | 6 |
| Fosetyl-Al | Salal | | 1 | 1 |
| Fosetyl-Al | Turnip | 5085 | 1 | 1 |
| Thiophanate-methyl | Canola | 8108 | 1 | 1 |
| Thiophanate-methyl | Pistachio | 6619 | 1 | 1 |
| Thiophanate-methyl | Potato | 2861 | 1 | 1 |

| |
|-----------|
| Herbicide |
|-----------|

| | | | | |
|------------------------|---------------------|------|---|----|
| Bentazon | Clover | 1840 | 1 | 1 |
| Clethodim | Collard | 6490 | 0 | 1 |
| Clethodim | Kale | 6489 | 0 | 1 |
| Clethodim | Mint | 5235 | 2 | 2 |
| Clethodim | Mustard Greens | 5222 | 1 | 7 |
| Clethodim | Spinach | 6243 | 1 | 1 |
| Clomazone | Mint | 6680 | 2 | 2 |
| Clopyralid | Beet (Garden) | 5432 | 1 | 1 |
| Clopyralid | Broccoli | 3514 | 1 | |
| Clopyralid | Cabbage | 3513 | 1 | 11 |
| Clopyralid | Canola | 5125 | 1 | 2 |
| Clopyralid | Cherry | 3622 | 1 | |
| Clopyralid | Crambe | 6571 | 1 | 1 |
| Clopyralid | Cranberry | 3882 | 1 | 1 |
| Clopyralid | Flax | 7223 | 1 | 1 |
| Clopyralid | Hops | 6480 | 1 | 1 |
| Clopyralid | Mustard Greens | 5010 | 1 | 7 |
| Clopyralid | Mustard Seed | | 1 | 1 |
| Clopyralid | Peach (Stone fruit) | 3621 | 1 | 8 |
| Clopyralid | Plum | 3625 | 1 | |
| Clopyralid | Spinach | 5434 | 1 | 1 |
| Clopyralid | Turnip | 6491 | 1 | 1 |
| Diflufenzopyr/Dicamba | Sweetcorn/Grass | 7376 | 5 | 25 |
| Ethalfuralin | Canola/Safflower | 6883 | 2 | 2 |
| Halosulfuron | Bean (Dry) | 6627 | 1 | 22 |
| Halosulfuron | Bean, (Snap) | 6452 | 1 | 14 |
| Triflusalufuron-Methyl | Chicory | 6709 | 1 | 1 |

| |
|-------------|
| Insecticide |
|-------------|

| | | | | |
|-----------------|----------------|------|---|----|
| Bifenazate | Mayhaw | 6784 | | 1 |
| Cyfluthrin | Garbanzo | 6535 | | 1 |
| Cyfluthrin | Pea (Dry) | 6533 | 2 | 21 |
| Cyfluthrin | Pea (Southern) | 5524 | | 1 |
| Cyromazine | Bean (Dry) | 6744 | 1 | 21 |
| Cyromazine | Pea (Southern) | 3906 | | 1 |
| Diflubenzuron | Grasses | 3871 | 3 | 23 |
| Diflubenzuron | Pear | 6367 | 1 | 1 |
| Methoxyfenozide | Artichoke | 7323 | 1 | 1 |
| Methoxyfenozide | Longan | | 1 | 1 |
| Methoxyfenozide | Lychee | 7069 | 1 | 1 |
| Methoxyfenozide | Pulasan | | 1 | 1 |
| Methoxyfenozide | Rambutan | | 1 | 1 |
| Methoxyfenozide | Spanish Lime | | 1 | 1 |
| Pyriproxyfen | Acerola | | 1 | 1 |
| Pyriproxyfen | Blueberry | 7233 | 1 | 5 |
| Pyriproxyfen | Feijoa | | 1 | 1 |
| Pyriproxyfen | Guava | 7374 | 1 | 1 |

| Approval Type Pesticide Type Chemical | Crop | PR # | Tolerances | New/Added Uses |
|---|--------------------|------|------------|-------------------|
| Pyriproxyfen | Jaboticaba | | 1 | 1 |
| Pyriproxyfen | Juneberry | | 1 | 1 |
| Pyriproxyfen | Lingonberry | | 1 | 1 |
| Pyriproxyfen | Longan | | 1 | 1 |
| Pyriproxyfen | Lychee | 7372 | 1 | 1 |
| Pyriproxyfen | Passion Fruit | | 1 | 1 |
| Pyriproxyfen | Pulasan | | 1 | 1 |
| Pyriproxyfen | Rambutan | | 1 | 1 |
| Pyriproxyfen | Salal | | 1 | 1 |
| Pyriproxyfen | Spanish Lime | | 1 | 1 |
| Pyriproxyfen | Starfruit | | 1 | 1 |
| Pyriproxyfen | Wax Jambu | | 1 | 1 |
| Spinosad | Basil | 6905 | 1 | 40 |
| Spinosad | Caneberry | 6825 | 1 | 4 |
| Spinosad | Fig | 8150 | 1 | 1 |
| Spinosad | Grape | 6851 | 2 | 1 |
| Spinosad | Peanut | 6908 | 1 | 1 |
| Spinosad | Radish (Root Veg.) | 7360 | 4 | 37 |

Time Limited Tolerance

Fungicide

| | | | | |
|--------------------|-----------|------|---|----|
| Azoxystrobin | Safflower | 8656 | 1 | 1 |
| Fenbuconazole | Blueberry | 6368 | 1 | 1 |
| Myclobutanil | Artichoke | 7020 | 1 | 1 |
| Myclobutanil | Sugarbeet | 7998 | 1 | 1 |
| Tebuconazole | Sunflower | 6414 | 1 | 1 |
| Thiabendazole | Lentil | 6531 | 1 | 1 |
| Thiophanate-methyl | Blueberry | 8309 | 1 | 1 |
| Thiophanate-methyl | Citrus | 8294 | 3 | 14 |
| Triflumazole | Filbert | 7996 | 1 | 1 |

Herbicide

| | | | | |
|----------------|-------------|------|---|---|
| 2,4-D | Soybean | 1167 | | |
| Carfentrazone | Pepper | 7959 | 1 | 6 |
| Carfentrazone | Tomato | 7960 | 1 | 3 |
| Dimethenamid-P | Onion | 6337 | 1 | 4 |
| Dimethenamid-P | Sugarbeet | 7702 | 1 | 1 |
| S-Metolachlor | Spinach | 1217 | 1 | 1 |
| S-Metolachlor | Tomato | 2000 | 1 | 1 |
| Pendimethalin | Mint | 5523 | 1 | 2 |
| Sulfentrazone | Bean (Lima) | 7583 | 1 | 1 |
| Sulfentrazone | Flax Seed | 7584 | 1 | 1 |
| Sulfentrazone | Potato | 7723 | 1 | 1 |
| Sulfentrazone | Tomato (GH) | 8035 | 1 | 1 |

Insecticide

| | | | | |
|---------------|---------------|------|---|---|
| Coumaphos | Honey and Wax | 7371 | 2 | 2 |
| Diflubenzuron | Alfalfa | 8678 | 1 | 1 |
| Hexythiazox | Date | 6957 | 1 | 1 |
| Imidacloprid | Blueberry | 6817 | 1 | 1 |
| Imidacloprid | Strawberry | 6260 | 1 | 1 |
| Indoxacarb | Cranberry | 8127 | 1 | 1 |

Attachment 5

IR-4/USDA Crop Grouping Symposium Results Summary

Summary: 28 crop groups with 19 established and 9 proposed

Results

I. Existing Crop Groups (40 CFR 180.41)

Results: Retain the existing Crop Groups with significant additions/modifications

- | | |
|--|--|
| 1. Vegetable, root and tuber | 10. Fruit, citrus |
| 2. Vegetable, leaves of root and tuber | 11. Fruit, pome |
| 3. Vegetable, bulb | 12. Fruit, stone |
| 4. Vegetable, leafy except brassica | 13. Berry |
| 5. Vegetable, brassica leafy | 14. Nut, tree |
| 6. Vegetable, legume | 15. Grain, cereal |
| 7. Vegetable, foliage of legume | 16. Grain, cereal forage, fodder and straw |
| 8. Vegetable, fruiting | 17. Grass, forage, fodder and hay |
| 9. Vegetable, cucurbit | 18. Animal feed, nongrass |
| | 19. Herb and spice |

(Ref: Food and Feed Crops of the United States (a.k.a. Greenbook), page 337)

II. Proposed Additional Crop Groups

Results: Nine (9) proposed crop groups need to be established as noted below.

- A(21)* Stalk & stem vegetables
- B(-) Edible fungi (crop definition only, no group)
- C(-) Small fruits (combined with CG13)
- D(22) Tropical/subtropical fruits – edible peel
- E(23) Tropical/subtropical fruits – inedible peel
- F(20) Oilseed (Crop Group 20)
- G(-) Dried edible plant tops (stimulants) (combined with CG ‘H’)
- H(24) Teas
- I(25) Tropical/subtropical trees with edible seeds for beverages and sweets
- J(26) Grasses for sugar or syrup
- K(-) Forestry which included sugar maple for syrup (combined with CG ‘L’)
- L(28) Ornamentals
- M(27) Cactus

Ref: Food and Feed Crops of the United States, page 374, and other sources)

Note:

* Numbers in () are proposed Crop Group Numbers

CG = Crop Group

Attachment 5 (Continued)

IR-4/USDA Crop Grouping Symposium Proceedings

The first international Crop Grouping Symposium Proceedings, being finalized by George Markle and Sandy Perry, will be issued before the end of March 2003. The two-day Workshop provided the necessary expertise (crop and regulatory) to issue an authoritative report (Proceedings). Once the printed version is available in bound form, it will be distributed to all participants and to the food protection agencies in the U.S., Canada, Mexico, and Codex as published.

A cover letter will be included that will request the use of the Proceedings as the major reference to updating the regulatory Crop Grouping system internationally.

Crop Group Modifications

In order to update and provide guidance to our residue chemistry reviewers and our partner's USDA-IR-4 and California Department of Pesticide Regulation (CDPR) we have prepared this document which lists the revisions and amendments to the Commodity Definitions under 40 CFR § 180.1 (h) and Crop Group/Subgroups under 40 CFR § 180.41 that have been approved by the HED Chemistry Science Advisory Council (ChemSAC). The changes are entitled: I. Tropical and subtropical fruit commodity definitions; II. White sapote change to crop group and commodity definition; III. Commodity definition change for celery; IV. New commodity definition for parsley = cilantro; V. New commodity definition for winter squash; VI. Crop group change for turnip greens; VII. Almond residue data translatable to pistachios; VIII. Lingonberry, Juneberry, and Salal added to Crop Group 13 Berries and Crop Subgroup 13-B Bushberry; IX. Establishment of the Oilseed Crop Group 20. Items I to VIII were reported in the 2001 IR-4 Annual Report. Item IX was approved in 2002.

Reports written by Dr. B.A. Schneider of the U.S. EPA for the analysis of each commodity definition and crop group/subgroup revisions can be obtained from the author at 703-305-5555 or e-mail schneider.bernard@epa.gov. The correct commodity term for each of the commodities discussed in this document can be found in the EPA Food and Feed Commodity Vocabulary (see <http://www.epa.gov/pesticides/foodfeed>).

Establishment of the Oilseed Crop Group 20

A new Oilseed Crop Group 20 is being established to harmonize with Canada's Crop Group 20. The representative commodities for the crop group are rapeseed (canola varieties only) and sunflower seed. Members of this Crop Group will be rapeseed, seed; Indian rapeseed; Indian mustard, seed; field mustard, seed; black mustard, seed; flax, seed; sunflower, seed; safflower, seed; and crambe, seed. Borage seed will also be added as a member if Canada agrees to also add it to their Crop Group 20.

Until the Federal Register Notice is issued revising the Crop Group Regulation to establish the Oilseed Crop Group 20, tolerances for the representative commodities [rapeseed (canola, seed) and sunflower, seed] as well as all members of the crop group will be listed individually, and the tolerance level will be identical.

Attachment 6

Data Packages Completed in 2002

| Tolerance | Chemical | Crop | PR Number |
|---|--------------------------|--------------------|-----------|
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Conditional Registration</div> | | | |
| | Myclobutanil | Bean (Snap) | 3966 |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Label Amendment</div> | | | |
| | Buprofezin | Tomato (GH) | 7406 |
| | Clomazone | Pepper (Bell) | 7488 |
| | Clomazone | Pepper (Non-Bell) | 7489 |
| | Dimethoate | Pea (Dry) | 6650 |
| | Ethephon | Stonefruit | 3920 |
| | Glyphosate | Garlic | 6493 |
| | Glyphosate | Horseradish | 6704 |
| | Imidacloprid | Artichoke | 7358 |
| | Imidacloprid | Tomato (GH) | 7099 |
| | Spinosad | Grape | 6851 |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">New</div> | | | |
| | Azoxystrobin | Artichoke | 7364 |
| | Azoxystrobin | Basil | 7104 |
| | Azoxystrobin | Broccoli | 7096 |
| | Azoxystrobin | Cabbage | 7095 |
| | Bentazon | Peach | 5115 |
| | Bifenazate | Almond | 7904 |
| | Bifenazate | Cantaloup | 7510 |
| | Bifenazate | Cucumber | 7511 |
| | Bifenazate | Mint | 7386 |
| | Bifenazate | Pepper | 7552 |
| | Bifenazate | Pistachio | 7974 |
| | Bifenazate | Squash | 7512 |
| | Bifenazate | Tomato | 7266 |
| | Bifenazate | Tomato (GH) | 8035 |
| | Bifenthrin | Greens (Mustard) | 6970 |
| | Bifenthrin | Okra | 8080 |
| | Bifenthrin | Pea and Bean (Dry) | 7657 |
| | Bifenthrin | Tomato (GH) | A4868 |
| | Bifenthrin | Tuberous Corm | 8804 |
| | Buprofezin | Bean (Snap) | 7660 |
| | Buprofezin | Pistachio | 6832 |
| | Clethodim | Lettuce (Head) | 5223 |
| | Clethodim | Mint | 5235 |
| | Clomazone | Mint | 6680 |
| | Coumaphos | Honey and Wax | 7371 |
| | Cycolate | Swiss Chard | 3542 |
| | Cyprodinil | Almond | 8481 |
| | Cyprodinil + Fludioxonil | Basil | 7123 |
| | Cyprodinil + Fludioxonil | Blueberry | 6724 |
| | Cyprodinil + Fludioxonil | Broccoli | 7122 |

| Tolerance | Chemical | Crop | PR Number |
|------------------|--------------------------|---------------------|------------------------|
| | Cyprodinil + Fludioxonil | Cabbage | 7121 |
| | Cyprodinil + Fludioxonil | Carrot | 7090 |
| | Cyprodinil + Fludioxonil | Chives | 7126 |
| | Cyprodinil + Fludioxonil | Green (Mustard) | 7622 |
| | Cyprodinil + Fludioxonil | Lychee | 7760 |
| | Cyromazine | Broccoli | 8359 |
| | Cyromazine | Cauliflower | 8360 |
| | Cyromazine | Onion (Dry Bulb) | 7239 |
| | Cyromazine | Onion (Green) | 7238 |
| | DCPA | Many Crops | 2692, 8334, 2999, 3610 |
| | DCPA | Parsley | 4005 |
| | Dimethomorph | Cantaloup | 6753 |
| | Dimethomorph | Cucumber | 6754 |
| | Dimethomorph | Onion (Dry Bulb) | 7200 |
| | Dimethomorph | Onion (Green) | 7242 |
| | Dimethomorph | Pepper (All) | 6750 |
| | Dimethomorph | Squash | 6751 |
| | Diuron | Mint (All) | 6952 |
| | Ethalfuralin | Rapeseed | 8516 |
| | Ethofumesate | Beet (Garden) | 742 |
| | Ethofumesate | Carrot | 6703 |
| | Fenhexamid | Cherry (PH) | 6937 |
| | Fenhexamid | Cucumber (GH) | 7853 |
| | Fenhexamid | Kiwifruit | 7600 |
| | Fenhexamid | Lettuce (GH) | 7854 |
| | Fenhexamid | Peach (PH) | 6936 |
| | Fenhexamid | Plum (PH) | 7318 |
| | Fenhexamid | Tomato/Pepper (GH) | 7896 |
| | Fenpyroximate | Pear | 8346 |
| | Fipronil | Onion (Dry Bulb) | 7040 |
| | Glufosinate | Blueberry | 5291 |
| | Imidacloprid | Bean (Dry) | 6528 |
| | Imidacloprid | Beet (Garden) | 6305 |
| | Imidacloprid | Caneberry | 6817 |
| | Imidacloprid | Cherry | 7202 |
| | Imidacloprid | Guava | 7738 |
| | Imidacloprid | Lychee | 6676 |
| | Imidacloprid | Mamey Sapote | 6450 |
| | Imidacloprid | Mustard (Seed) | 8471 |
| | Imidacloprid | Okra | 6588 |
| | Imidacloprid | Papaya | 7351 |
| | Imidacloprid | Passion Fruit | 6449 |
| | Imidacloprid | Pea | 6398 |
| | Imidacloprid | Peach | 6399 |
| | Imidacloprid | Persimmon | 6734 |
| | Imidacloprid | Plum | 7279 |
| | Imidacloprid | Popcorn | 8464 |
| | Imidacloprid | Radish | 6308 |
| | Imidacloprid | Southern Pea | 6498 |
| | Imidacloprid | Strawberry | 6260 |
| | Imidacloprid | Turnip Roots | 6306 |
| | Linuron | Horseradish | 3609 |
| | Mesotrione | Popcorn | 8470 |
| | Metaldhyde | Prickly Pear Cactus | 7395 |
| | Methoxyfenozide | Cantaloup | 7195 |
| | Methoxyfenozide | Cranberry | 7355 |
| | Methoxyfenozide | Cucumber | 7016 |
| | Methoxyfenozide | Lychee | 7069 |

| Tolerance | Chemical | Crop | PR Number |
|------------------|---------------------------------|----------------------------|------------------|
| | Methoxyfenozide | Okra | 7741 |
| | Methoxyfenozide | Pea (Blackeyed) | 7018 |
| | Methoxyfenozide | Squash (Summer) | 7194 |
| | Methoxyfenozide | Turnip Greens | 7438 |
| | Pendimethalin | Apple | 6608 |
| | Pendimethalin | Apricot | 6674 |
| | Pendimethalin | Cherry | 6609 |
| | Pendimethalin | Peach | 6610 |
| | Pendimethalin | Pear | 6760 |
| | Pendimethalin | Plum | 6611 |
| | Pendimethalin | Pomegranate | 6669 |
| | Pirimicarb | Celery | 6573 |
| | Promalin | Starfruit | 8288 |
| | Propiconazole | Cranberry | 7359 |
| | Pymetrozine | Asparagus | 7341 |
| | Pyraclostrobin | Lettuce | 7640 |
| | Pyraclostrobin | Turnip Greens | 7594 |
| | Pyridaben | Cherry | 6737 |
| | Pyridaben | Papaya | 6695 |
| | Pyriproxyfen | Avocado | 8135 |
| | Pyriproxyfen | Fig | 8258 |
| | Pyriproxyfen | Okra | 7414 |
| | Pyriproxyfen | Sugar Apple | A7010 |
| | Pyriproxyfen | Tropical Crops | 8135 |
| | Quinoxifen | Cherry | 7757 (A7757) |
| | Spiroxamine | Hops | 6946 |
| | Sulfentrazone | Asparagus | 6661 |
| | Sulfentrazone | Bean (Lima) | 7583 |
| | Sulfentrazone | Potato | 7723 |
| | Tebufenozide | Grape | 6763 |
| | Thiacloprid | Cherry | 7812 |
| | Thiacloprid | Peach | 7811 |
| | Thiacloprid | Plum | 8038 |
| | Thiamethoxam | Bean (Succulent) | 7589 |
| | Thiamethoxam | Cherry | 7673 |
| | Thiamethoxam | Peach | 7052 |
| | Thiamethoxam | Plum | 7674 |
| | Thiamethoxam | Sunflower (Seed Treatment) | 8465 |
| | Thiophanate-Methyl | Corn (Sweet) | 6956 |
| | Thymol | Honey and Wax | 160B |
| | Trifloxystrobin | Carrot | 7045 |
| | Trifloxystrobin | Celery | 7046 |
| | <i>Verticillium dahliae</i> | American Elm | 86B |
| | WCS 850 | | |
| | Zinc Phosphide | Alfalfa | 6632 |
| | <i>Aspergillus flavus</i> AF-36 | Cotton | 52B |
| | Sodium metasilicate | All RACs | 886 |

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| New/EUP |
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| Tolerance | Chemical | Crop | PR Number |
|---------------------|------------------|------------|------------------------|
| Reregistration | Metaldehyde | Blueberry | 4526 |
| | Metaldehyde | Caneberry | 4526 |
| | Metaldehyde | Watercress | 7370 |
| Tolerance Exemption | Imazamox | All RACs | 7219, 8501, 8502, 8255 |
| | Yeast Hydroysate | All RACs | 200B |

ATTACHMENT 7

Regulatory Documents in Preparation

| CHEMICAL | COMMODITY | PR# | CHEMICAL | COMMODITY | PR# |
|---------------------|---------------------|------|---------------------------------|-------------------|-------|
| • 2,4-D | Potato | 1029 | • Cyfluthrin | Grasses | 6837 |
| • Abamectin | Bean (Dry) | 5001 | • Cyfluthrin | Sweetpotato | 8140 |
| • Abamectin | Bean (Lima) | 7271 | • Cyfluthrin + Tebupirimphos | Potato | 7665 |
| • Abamectin | Bean (Snap) | 5478 | • Cyfluthrin + Tebupirimphos | Sweetpotato | 7664 |
| • Abamectin | Caneberry | 6475 | • Cyhexatin | Mint | 1715 |
| • Abamectin | Chives | 7102 | • Cyprodinil + Fludioxonil | Bean (Dry) | 7782 |
| • Abamectin | Guava | 6435 | • Cyprodinil + Fludioxonil | Bean (Lima) | 7783 |
| • Abamectin | Lychee | 7831 | • Cyprodinil + Fludioxonil | Bean (Snap) | 7614 |
| • Abamectin | Onion (Dry Bulb) | 7237 | • Cyprodinil + Fludioxonil | Lettuce | 7131 |
| • Abamectin | Onion (Green) | 4068 | • Desmedipham | Beet (Garden) | 337 |
| • Abamectin | Papaya | 4078 | • Desmedipham | Spinach | 1922 |
| • AVG | Cherry | 8052 | • Difenconazole | Yam | 6958 |
| • AVG | Peach | 8053 | • Diflubenzuron | Mustard Greens | 8031 |
| • AVG | Plum | 8054 | • Dimethenamid-P | Onion (Green) | 7699 |
| • Azoxystrobin | Chives | 7105 | • Dimethenamid-P | Rutabaga | 7697 |
| • Azoxystrobin | Citrus | 7593 | • Dimethenamid-P | Turnip | 7696 |
| • Azoxystrobin | Dill | 7363 | • Dimethoate | Pea (Succulent) | A6693 |
| • Azoxystrobin | Parsley | 7111 | • Dimethomorph | (Greens (Mustard) | 7247 |
| • Azoxystrobin | Sunflower | 7258 | • Dimethomorph | Taro | 7335 |
| • BAS 516 | Celery | 8091 | • Diquat | Garlic | 6492 |
| • BAS 516 | Spinach | 8090 | • Diuron | Peach | 7962 |
| • Bifenazate | Cherry | 7054 | • Emamectin | Cucumber | 6987 |
| • Bifenazate | Cilantro | 7557 | • Ethephon | Filbert | 4462 |
| • Bromoxynil | Leek | 6058 | • Ethofumesate | Beet (Garden) | 742 |
| • Buprofezin | Avocado | 7740 | • Ethofumesate | Carrot | 6703 |
| • Buprofezin | Peach | 7517 | • Ethofumesate | Onion | 5398 |
| • Buprofezin | Pear | 7518 | • Ethoprop | Pepper | 5323 |
| • Carfentrazone | Hops | 7596 | • Famoxadone + Cymoxanil | Hops | 7796 |
| • Carfentrazone | Pepper | 7959 | • Fenarimol | Hops | 6940 |
| • Carfentrazone | Tomato | 7960 | • Fenbuconazole | Pepper | 6372 |
| • Carfentrazone | Tropical Tree Fruit | 8472 | • Fenhexamid | Apple | 7601 |
| • Chlorimuron-ethyl | Cranberry | 3023 | • Fenhexamid | Pear | 7402 |
| • Chlorothalonil | Eggplant | 1154 | • Fenpropathrin | Blueberry | 7815 |
| • Chlorothalonil | Pepper (Non-Bell) | 571 | • Fipronil | Plantain | 6712 |
| • Chlorothalonil | Pepper (Bell) | 32 | • Fipronil | Potato/Popcorn | 6988 |
| • Chlorothalonil | Persimmon | 5388 | • Fludioxonil | Apple (PH) | 7568 |
| • Clethodim | Asparagus | 5427 | • Fludioxonil | Cantaloup | 7618 |
| • Clethodim | Basil | 5759 | • Fludioxonil | Citrus (PH) | 7947 |
| • Clethodim | Bean (Dry) | 5204 | • Fludioxonil | Pear | 7569 |
| • Clethodim | Bean (Lima) | 5206 | • Fludioxonil | Yam | 8107 |
| • Clethodim | Bean (Snap) | 5205 | • Flufenacet | Potato | 8326 |
| • Clethodim | Chives | 6246 | • Flumioxazin | Mint | 8075 |
| • Clethodim | Endive | 5221 | • Flumioxazin | Onion (Dry Bulb) | 7389 |
| • Clethodim | Flax | 7558 | • Flumioxazin | Potato | 7964 |
| • Clethodim | Hops | 8086 | • Fluroxypyr | Apple | 7706 |
| • Clethodim | Lettuce (Head) | 7694 | • Fluroxypyr | Onion (Dry Bulb) | 7705 |
| • Clethodim | Lettuce (Head) | 5223 | • Fluroxypyr | Pear | 7707 |
| • Clethodim | Sesame | 7756 | • Glufosinate | Corn (Sweet) | 6953 |
| • Clofentezine | Persimmon | 6601 | • Glufosinate | Corn (Sweet) | 6515 |
| • Clopyralid | Blueberry | 5433 | | | |
| • Clopyralid | Flax | 7223 | | | |
| • Clopyralid | Pear | 3624 | | | |
| • Clopyralid | Strawberry | 8132 | | | |
| • Cyfluthrin | Grass | 6837 | | | |

| CHEMICAL | COMMODITY | PR# |
|----------------------------|------------------|-------|
| • Glyphosate | Horseradish | A6704 |
| • Glyphosate | Lettuce (Head) | 7547 |
| • Glyphosate | Lettuce (Leaf) | 7229 |
| • Glyphosate | Safflower | 6162 |
| • Glyphosate | Sunflower | 6164 |
| • Halosulfuron | Pea (Succulent) | 7286 |
| • Halosulfuron | Potato | 7281 |
| • Imazalil + Propiconazole | Grape | 6819 |
| • Imidacloprid | Banana | 7333 |
| • Imidacloprid | Basil | 6258 |
| • Imidacloprid | Caneberry | 7523 |
| • Imidacloprid | Chives | 6259 |
| • Imidacloprid | Coffee | 6928 |
| • Imidacloprid | Coffee | 5760 |
| • Imidacloprid | Peanut | 6587 |
| • Imidacloprid | Sugar Apple | 6993 |
| • Linuron | Celeriac | 3557 |
| • Linuron | Coriander | 1625 |
| • Linuron | Parsley | 3035 |
| • MBTA-HCL | Grapefruit | 7785 |
| • Mefenoxam + Cu | Bean (Lima) | 6776 |
| • Metaldehyde | Artichoke | 7396 |
| • Methoxyfenozide | Bean (Snap) | 7532 |
| • Methoxyfenozide | Bean (Succulent) | 7531 |
| • Methoxyfenozide | Beet (Sugar) | 7522 |
| • Methoxyfenozide | Carrot | 7520 |
| • Methoxyfenozide | Grasses | 7524 |
| • Methoxyfenozide | Mint | 7755 |
| • Methoxyfenozide | Papaya | 7063 |
| • Methoxyfenozide | Pea (Podded) | 7529 |
| • Methoxyfenozide | Pea (Succulent) | 7528 |
| • Methoxyfenozide | Pistachio | 8290 |
| • Methoxyfenozide | Radish | 7521 |
| • Methoxyfenozide | Strawberry | 6768 |
| • Metribuzin | Garlic | 6386 |
| • Metribuzin | Pea (Succulent) | 6388 |
| • Myclobutanil | Artichoke | 7020 |
| • Myclobutanil | Bean (Snap) | 3966 |
| • Myclobutanil | Currant | A5309 |
| • Myclobutanil | Gooseberry | A5308 |
| • Myclobutanil | Lettuce | 7577 |
| • Myclobutanil | Mint | A5409 |
| • Myclobutanil | Papaya | 7744 |
| • NAA | Almond | 3524 |
| • NAA | Grapefruit | 7578 |
| • NAA | Plum | 3523 |
| • NAA | Pomegranate | 5389 |
| • NAA | Walnut | 3525 |
| • Oxyfluorfen | Banana | 6697 |
| • Oxyfluorfen | Mint | 6699 |
| • Oxyfluorfen | Pejibaye | 6606 |
| • Oxyfluorfen | Rhubarb | 6592 |
| • Oxyfluorfen | Safflower | 5454 |
| • Paraquat | Broccoli | 1475 |
| • Paraquat | Cantaloup | 1476 |
| • Paraquat | Ginger | 7824 |
| • Paraquat | Mustard Greens | 2980 |
| • Paraquat | Safflower | 2939 |
| • Paraquat | Squash (Summer) | 2982 |

| CHEMICAL | COMMODITY | PR# |
|-------------------|-----------------------|-------|
| • Pendimethalin | Artichoke | 6623 |
| • Pendimethalin | Asparagus | 6660 |
| • Pendimethalin | Broccoli | 6505 |
| • Pendimethalin | Cabbage | 6387 |
| • Pendimethalin | Carrot | 4084 |
| • Pendimethalin | Fig | 6607 |
| • Pendimethalin | Grape | 5740 |
| • Pendimethalin | Grass (Seed Crop) | 4912 |
| • Pendimethalin | Kiwi | 6681 |
| • Pendimethalin | Mustard Greens | 1986 |
| • Pendimethalin | Onion (Green) | 5097 |
| • Pendimethalin | Strawberry | 2739 |
| • Pendimethalin | Spinach | 5693 |
| • Prometryn | Carrot | 1682 |
| • Prometryn | Celeriac | 3567 |
| • Prometryn | Leaf Petioles | 2480 |
| • Prometryn | Parsley | 3618 |
| • Pronamide | Caneberry | 3593 |
| • Pronamide | Chicory | 6474 |
| • Pronamide | Chicory | 6729 |
| • Pronamide | Grasses (Pasture) | 2297 |
| • Pronamide | Safflower | 5456 |
| • Propiconazole | Artichoke | 6900 |
| • Propiconazole | Beet (Garden) | 6352 |
| • Propiconazole | Parsley | 6351 |
| • Propiconazole | Pineapple | 6585 |
| • Propiconazole | Turnip (Roots + Tops) | 6237 |
| • Propylene Oxide | Fig | 7887 |
| • Propylene Oxide | Raisin | 7897 |
| • Pyriproxyfen | Onion (Dry Bulb) | 7886 |
| • Pyriproxyfen | Pea (Southern) | 7179 |
| • Pyriproxyfen | White Sapote et. al. | 5103 |
| • Quinoxifen | Cantaloup | 7252 |
| • Quinoxifen | Pepper | 8006 |
| • Quizalofop | Pineapple | 5174 |
| • Sethoxydim | Borage | 7208 |
| • Sethoxydim | Buckwheat | A1348 |
| • Sethoxydim | Cantaloup | 7343 |
| • Sethoxydim | Dill | 7297 |
| • Sethoxydim | Mustard (Greens) | 6291 |
| • Sethoxydim | Okra | A2339 |
| • Sethoxydim | Radish | A2469 |
| • S-Metolachlor | Blueberry | 2616 |
| • S-Metolachlor | Caneberry | 3497 |
| • S-Metolachlor | Sesame | 6516 |
| • S-Metolachlor | Squash (Winter) | 6630 |
| • Spinosad | All RAC's | 8095 |
| • Spinosad | Banana | 7332 |
| • Spinosad | Grasses | 8040 |
| • Spinosad | Mint | 7347 |
| • Spinosad | Nectarine | 7580 |
| • Spinosad | Onion (Green) | 6652 |
| • Sulfentrazone | Broccoli | 7724 |
| • Sulfentrazone | Mustard (Greens) | 7781 |
| • Tebuconazole | Asparagus | 7991 |
| • Tebuconazole | Barley | 6513 |
| • Tebuconazole | Beet (Garden) | 6353 |
| • Tebuconazole | Mustard (Greens) | 6233 |
| • Tebuconazole | Onion (Dry Bulb) | 7194 |

| CHEMICAL | COMMODITY | PR# |
|-------------------------|------------------|------------|
| • Tebuconazole | Onion (Green) | 7245 |
| • Terbacil | Watermelon | 2841 |
| • Thiamethoxam | Bean (Dry) | 7675 |
| • Thiamethoxam | Blueberry | 7051 |
| • Thiamethoxam | Carrot | 7468 |
| • Thiamethoxam | Cranberry | 7754 |
| • Thiamethoxam | Pea (Dry) | 7590 |
| • Thiamethoxam | Pea (Succulent) | 7676 |
| • Thiamethoxam | Radish | 7677 |
| • Thifensulfuron-methyl | Safflower | A3454 |
| • Thiophanate-methyl | Sunflower | 5352 |

| CHEMICAL | COMMODITY | PR# |
|---------------------|------------------|------------|
| • Tribenuron-methyl | Sunflower | 8138 |
| • Zeta-cypermethrin | Turnip Greens | 7548 |
| • Ziram | Caneberry | 4118 |
| • Zoxamide | Spinach | 7485 |
| • Zoxamide | Sunflower | 7809 |
| • Zoxamide | Taro | 8122 |

Attachment 8

Ornamental Pest Control Registrations - 2002

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
|-----------------------------|---|------------|-----------------------------|---|------------|
| • Acephate | Boston Daisy (Argyranthemum) | 19242A | • Azadirachtin (Aza-Direct) | Purpleleaf Wintercreeper (<i>Euonymus radicans</i>) | 21560A |
| • Acephate | Dahlia | 12708A | • Azadirachtin (Aza-Direct) | Rose (Rosa) | 21611A |
| • Acephate | Namaqualand Daisy | 19288A | • Azadirachtin (Aza-Direct) | Sage (Salvia x sylvestris) | 21614A |
| • Acephate | Shasta Daisy (Field Container) | 19266A | • Azadirachtin (Aza-Direct) | Snapdragon (<i>Antirrhinum majus</i>) | 21532A |
| • Acephate | Shasta Daisy (Greenhouse) | 19267A | • Azadirachtin (Aza-Direct) | Snapdragon (<i>Antirrhinum majus</i>) | 21625A |
| • Acephate | Shrub Verbena | 19265A | • Azadirachtin (Aza-Direct) | Stock (Matthiola incana) | 21593A |
| • Azadirachtin (Aza-Direct) | Balsam (Impatiens) | 21580A | • Azadirachtin (Aza-Direct) | Tailflower (Anthurium) | 21531A |
| • Azadirachtin (Aza-Direct) | Begonia | 21536A | • Azadirachtin (Aza-Direct) | Tailflower (Anthurium) | 21624A |
| • Azadirachtin (Aza-Direct) | Blanket Flower (Gaillardia) | 21566A | • Azadirachtin (Aza-Direct) | Transvaal Daisy (Gerbera) | 21569A |
| • Azadirachtin (Aza-Direct) | Bougainvillea | 21537A | • Azadirachtin (Aza-Direct) | Umbrella Tree (Schefflera) | 21538A |
| • Azadirachtin (Aza-Direct) | Calathea | 21540A | • Azadirachtin (Aza-Direct) | Vervain (Verbena) | 21619A |
| • Azadirachtin (Aza-Direct) | Camellia | 21541A | • Azadirachtin (Aza-Direct) | Zebra Plant, Saffron Spike | 21533A |
| • Azadirachtin (Aza-Direct) | Camellia | 21628A | • Azadirachtin (Aza-Direct) | Zinnia | 21622A |
| • Azadirachtin (Aza-Direct) | Columbine (Aquilegia) | 21534A | • Azadirachtin (Aza-Direct) | African Violet (Saintpaulia) | 20996A |
| • Azadirachtin (Aza-Direct) | Dahlia | 21553A | • Azadirachtin (Aza-Direct) | African Violet (Saintpaulia) | 21002A |
| • Azadirachtin (Aza-Direct) | Dogwood, Flowering | 21552A | • Azadirachtin (Aza-Direct) | Ageratum | 21011A |
| • Azadirachtin (Aza-Direct) | Dumb Cane (Dieffenbachia) | 21556A | • Azadirachtin (Aza-Direct) | Arrowwood (Viburnum) | 21020A |
| • Azadirachtin (Aza-Direct) | English Ivy (<i>Hedera helix</i>) | 21571A | • Azadirachtin (Aza-Direct) | Balsam (Impatiens) | 20999A |
| • Azadirachtin (Aza-Direct) | Fern, Boston, Sword | 21595A | • Azadirachtin (Aza-Direct) | Balsam (Impatiens) | 21005A |
| • Azadirachtin (Aza-Direct) | Flag (Iris) | 21631A | • Azadirachtin (Aza-Direct) | Begonia | 20997A |
| • Azadirachtin (Aza-Direct) | Gardenia | 21567A | • Azadirachtin (Aza-Direct) | Begonia | 21003A |
| • Azadirachtin (Aza-Direct) | Geranium (Geranium sp.) | 21600A | • Azadirachtin (Aza-Direct) | Cotoneaster | 21013A |
| • Azadirachtin (Aza-Direct) | Geranium (Pelargonium) | 21568A | • Azadirachtin (Aza-Direct) | Dumb Cane (Dieffenbachia) | 21014A |
| • Azadirachtin (Aza-Direct) | Holly (Ilex) | 21579A | • Azadirachtin (Aza-Direct) | Fern (Polypodium) | 20998A |
| • Azadirachtin (Aza-Direct) | Hydrangea | 21578A | • Azadirachtin (Aza-Direct) | Fern (Polypodium) | 21004A |
| • Azadirachtin (Aza-Direct) | Japanese Pittosporum | 21608A | • Azadirachtin (Aza-Direct) | Gardenia | 21015A |
| • Azadirachtin (Aza-Direct) | Juniper (Juniperus) | 21583A | • Azadirachtin (Aza-Direct) | Honey Locust (Gleditsia) | 21016A |
| • Azadirachtin (Aza-Direct) | Larkspur (Delphinium) | 21554A | • Azadirachtin (Aza-Direct) | Linden, Basswood (Talia) | 21017A |
| • Azadirachtin (Aza-Direct) | Leatherleaf Fig (Ficus) | 21564A | • Azadirachtin (Aza-Direct) | Lupine (Lupinus) | 21018A |
| • Azadirachtin (Aza-Direct) | Lilac (Syringa) | 21617A | | | |
| • Azadirachtin (Aza-Direct) | Lily (Lilium) | 21587A | | | |
| • Azadirachtin (Aza-Direct) | Marigold (Tagetes) | 21618A | | | |
| • Azadirachtin (Aza-Direct) | Pansy (Viola) | 21621A | | | |
| • Azadirachtin (Aza-Direct) | Peony (Paeonia) | 21598A | | | |
| • Azadirachtin (Aza-Direct) | Persian Violet (Cyclamen) | 21563A | | | |
| • Azadirachtin (Aza-Direct) | Petunia | 21603A | | | |
| • Azadirachtin (Aza-Direct) | Philodendron | 21604A | | | |
| • Azadirachtin (Aza-Direct) | Phlox (<i>Phlox laphamii</i>) | 21605A | | | |
| • Azadirachtin (Aza-Direct) | Photinia | 21606A | | | |
| • Azadirachtin (Aza-Direct) | Pine (Pinus) | 21607A | | | |
| • Azadirachtin (Aza-Direct) | Pinks (Dianthus) | 21555A | | | |
| • Azadirachtin (Aza-Direct) | Pinks (Dianthus) | 21630A | | | |
| • Azadirachtin (Aza-Direct) | Poinsettia (<i>Euphorbia pulcherrima</i>) | 21561A | | | |
| • Azadirachtin (Aza-Direct) | Privet (Ligustrum) | 21586A | | | |

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
|--|---|------------|---------------------------|--|------------|
| • Azadirachtin (Nimbecidine) | Palm, Bamboo (<i>Chameadore</i> <i>erumpens</i>) | 21008A | • Clethodim | Bearberry (<i>Arctostaphylos</i>) | 20723A |
| • Azadirachtin (Nimbecidine) | Pansy (<i>Viola</i>) | 21000A | • Clethodim | Bee Balm (<i>Monarda</i> <i>didyma</i>) | 20910A |
| • Azadirachtin (Nimbecidine) | Pansy (<i>Viola</i>) | 21006A | • Clethodim | Bee Balm (<i>Monarda</i> <i>didyma</i>) | 20911A |
| • Azadirachtin (Nimbecidine) | Periwinkle | 21019A | • Clethodim | Blazing-Star, Gayfeather (<i>Liatris</i>) | 13278A |
| • Azadirachtin (Nimbecidine) | Persian Violet (<i>Cyclamen</i>) | 21009A | • Clethodim | Blue Lyme Grass (<i>Leymus areanarius</i>) | 20855A |
| • Azadirachtin (Nimbecidine) | Purpleleaf | 21012A | • Clethodim | Bluestar (<i>Amsonia</i>) | 13274A |
| • Azadirachtin (Nimbecidine) | Wintercreeper (<i>Euonymus radicans</i>) | 21010A | • Clethodim | Bluettes (<i>Houstonia</i> <i>serpyllifolia</i>) | 20708A |
| • Azadirachtin (Nimbecidine) | Shrub Verbena (<i>Lantana</i>) | 21010A | • Clethodim | Bluettes (<i>Houstonia</i> <i>serpyllifolia</i>) | 20728A |
| • Azadirachtin (Nimbecidine) | Vervain (<i>Verbena</i>) | 21001A | • Clethodim | Butterfly Bush (<i>Buddleia davidii</i>) | 20896A |
| • Azadirachtin (Nimbecidine) | Vervain (<i>Verbena</i>) | 21007A | • Clethodim | Cardinal Flower, Indian Pink | 13279A |
| • Chlorfenapyr | Begonia | 21428A | • Clethodim | Catnip (<i>Nepeta cataria</i>) | 20716A |
| • Chlorfenapyr | Begonia | 21474A | • Clethodim | Catnip (<i>Nepeta cataria</i>) | 20737A |
| • Chlorfenapyr | Chrysanthemum | 21429A | • Clethodim | Cherry (Non-Bearing) (<i>Prunus</i> sp.) | 17246A |
| • Chlorfenapyr | Chrysanthemum | 21475A | • Clethodim | Cherry (Non-Bearing) (<i>Prunus</i> sp.) | 17247A |
| • Chlorfenapyr | Transvaal Daisy (<i>Gerbera</i>) | 21665A | • Clethodim | China Aster (<i>Callistephus</i> <i>chinensis</i>) | 13108A |
| • Chlorfenapyr | Vervain (<i>Verbena</i>) | 21663A | • Clethodim | China Aster (<i>Callistephus</i> <i>chinensis</i>) | 13109A |
| • Chlormequat Chloride | Aster | 19669A | • Clethodim | Cockscomb, Wool Flower (<i>Celosia</i>) | 13110A |
| • Chlormequat Chloride | Coleus, Flamenettle | 13496A | • Clethodim | Cockscomb, Wool Flower (<i>Celosia</i>) | 1311A |
| • Chlormequat Chloride | Lily, Easter (<i>Lilium</i> <i>longiflorum</i>) | 19672A | • Clethodim | Cosmos | 13189A |
| • Chlormequat Chloride | Sunflower (<i>Helianthus</i>) | 19676A | • Clethodim | Creeping St.-Johns- Wort (<i>Hypericum</i> <i>calycinum</i>) | 20710A |
| • Chlormequat Chloride | Zinnia | 19679A | • Clethodim | Creeping St.-Johns- Wort (<i>Hypericum</i> <i>calycinum</i>) | 20731A |
| • Chlorothalonil | Pine (<i>Pinus</i>) | 08201A | • Clethodim | Dead Nettle (<i>Lamium</i>) | 20919A |
| • Chlorothalonil | Purpleleaf Wintercreeper (<i>Euonymus radicans</i>) | 12496A | • Clethodim | Dead Nettle (<i>Lamium</i>) | 20920A |
| • Chlorothalonil + Thiophanate-Methyl | Pinks (<i>Dianthus</i>) | 21393A | • Clethodim | Dogwood, Red Osier (<i>Cornus sericea</i>) | 17248A |
| • Chlorothalonil + Thiophanate-Methyl | Rose (<i>Rosa</i>) | 18965A | • Clethodim | Dogwood, Red Osier (<i>Cornus sericea</i>) | 17249A |
| • Chlorothalonil + Thiophanate-Methyl | Rose (<i>Rosa</i>) | 18970A | • Clethodim | Evening Primrose, Sundrops (<i>Oenothera</i>) | 12190A |
| • Chlorpyrifos | African Violet (<i>Saintpaulia</i>) | 08063A | • Clethodim | False Spirea (<i>Astilbe</i>) | 12184A |
| • Chlorpyrifos | Azalea (<i>Rhododendron</i>) | 12094A | • Clethodim | Fern, Autumn, Shield, Wood (<i>Dryopteris</i>) | 19737A |
| • Chlorpyrifos | Geranium (<i>Pelargonium</i>) | 12101A | • Clethodim | Fern, Royal, Flowering | 17253A |
| • Chlorpyrifos | Juniper (<i>Juniperus</i>) | 12096A | • Clethodim | Fern (<i>Osmunda</i>) | 17252A |
| • Chlorpyrifos | Persian Violet (<i>Cyclamen</i>) | 08065A | • Clethodim | Fern, Shaggy Shield (<i>Dryopteris</i>) | 17251A |
| • Chlorpyrifos | Rhododendron | 12095A | • Clethodim | Fern, Uncrested Lady (<i>Athyrium</i>) | 17251A |
| • Chlorpyrifos | Rhododendron | 12104A | • Clethodim | Foxglove (<i>Digitalis</i>) | 12185A |
| • Clethodim | Arborvitae (<i>Thuja</i>) | 19604A | • Clethodim | | |
| • Clethodim | Aster, Bolton (<i>Boltonia</i>) | 13275A | | | |
| • Clethodim | Aster, Michaelmas | 18606A | | | |
| • Clethodim | Aster, New York | 18607A | | | |
| • Clethodim | Beach Plum | 19735A | | | |
| • Clethodim | Bearberry (<i>Arctostahylos</i>) | 20702A | | | |

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
|---------------------------|--|------------|-----------------------------------|---|------------|
| • Clethodim | Gaura (<i>Gaura lindheimeri</i>) | 17255A | • Clethodim | Ribbon-Grass, Gardeners-Garters (<i>Phalaris arundinacea</i>) | 20854A |
| • Clethodim | Godetia, Farewell-To-Spring (Clarkia) | 19294A | • Clethodim | Rupture Wort (<i>Herniaria glabra</i>) | 20706A |
| • Clethodim | Gold Flower (Hypericum x Moseranium) | 20711A | • Clethodim | Rupture Wort (<i>Herniaria glabra</i>) | 20727A |
| • Clethodim | Gold Flower (Hypericum x Moseranium) | 20732A | • Clethodim | Sage, Russian; Blue Spire (Perovskia) | 13281A |
| • Clethodim | Golden Bells (Forsythia) | 12186A | • Clethodim | Sandwort (Arenaria) | 20703A |
| • Clethodim | Golden Bells (Forsythia) | 17250A | • Clethodim | Sandwort (Arenaria) | 20724A |
| • Clethodim | Golden Star (Chrysogonum) | 20705A | • Clethodim | Sea Holly (<i>Eryngium maritimum</i>) | 13277A |
| • Clethodim | Golden Star (Chrysogonum) | 20726A | • Clethodim | Sedge (Carex) | 20704A |
| • Clethodim | Goldenrod, Dwarf (<i>Solidago sphacelata</i>) | 20718A | • Clethodim | Sedge (Carex) | 20725A |
| • Clethodim | Goldenrod, Dwarf (<i>Solidago sphacelata</i>) | 20739A | • Clethodim | Speedwell, Brooklime (Veronica) | 17258A |
| • Clethodim | Hydrangea | 12189A | • Clethodim | Speedwell, Brooklime (Veronica) | 20720A |
| • Clethodim | Hydrangea, Climbing (<i>Hydrangea anomala</i>) | 20702A | • Clethodim | Speedwell, Brooklime (Veronica) | 20741A |
| • Clethodim | Hydrangea, Climbing (<i>Hydrangea anomala</i>) | 20729A | • Clethodim | Statice (Limonium) | 13112A |
| • Clethodim | Jacob's Ladder (Polemonium) | 17257A | • Clethodim | Statice (Limonium) | 13113A |
| • Clethodim | Lady's-Mantle (Alchemilla) | 20701A | • Clethodim | Strawflower (<i>Helichrysum bracteatum</i>) | 13114A |
| • Clethodim | Lady's-Mantle | 20722A | • Clethodim | Strawflower (<i>Helichrysum bracteatum</i>) | 13115A |
| • Clethodim | Larkspur (Delphinium) | 13116A | • Clethodim | Summersweet (<i>Clethra alnifolia</i>) | 20897A |
| • Clethodim | Larkspur (Delphinium) | 13117A | • Clethodim | Thyme, Creeping (<i>Thymus praecox</i>) | 20719A |
| • Clethodim | Magnolia | 19608A | • Clethodim | Thyme, Creeping (<i>Thymus praecox</i>) | 20740A |
| • Clethodim | Mazus (<i>Mazus reptans</i>) | 20714A | • Clethodim | Virginia Sweetspire (<i>Itea virginica</i>) | 20898A |
| • Clethodim | Mazus (<i>Mazus reptans</i>) | 20735A | • Clethodim | Yarrow, Woolly (<i>Achillea tomentosa</i>) | 20700A |
| • Clethodim | Ornamental Cabbage (Brassica sp.) | 13272A | • Clethodim | Yarrow, Woolly (<i>Achillea tomentosa</i>) | 20721A |
| • Clethodim | Ornamental Cabbage (Brassica sp.) | 18457A | • Clethodim | Yellow Archangel (<i>Lamium galeobdolon</i>) | 20712A |
| • Clethodim | Ornamental Gourd (Cucumis pepo) | 21632A | • Clethodim | Yellow Archangel (<i>Lamium galeobdolon</i>) | 20733A |
| • Clethodim | Ornamental Kale (Brassica sp.) | 13273A | • Clethodim | Yew (Taxus) | 19605A |
| • Clethodim | Ornamental Kale (Brassica sp.) | 18442A | • Clethodim | Hawthorn (Crateagus) | 05988A |
| • Clethodim | Pennywort (<i>Hydrocotyl sibthorpiodes</i>) | 20709A | • Copper Hydroxide | Holly (Ilex) | 04214A |
| • Clethodim | Pennywort (<i>Hydrocotyl sibthorpiodes</i>) | 20730A | • Copper Hydroxide | Poinsettia (<i>Euphorbia pulcherrima</i>) | 05962A |
| • Clethodim | Peony (Paeonia) | 20715A | • Copper Hydroxide | Poinsettia (<i>Euphorbia pulcherrima</i>) | 05963A |
| • Clethodim | Peony (Paeonia) | 20736A | • Copper Hydroxide | Privet (Ligustrum) | 02916A |
| • Clethodim | Phuopsis (<i>Phuopsis stylosa</i>) | 20717A | • Copper Hydroxide | Wandering Jew (<i>Tradescantia albiflora</i>) | 04348A |
| • Clethodim | Phuopsis (<i>Phuopsis stylosa</i>) | 20738A | • Copper Salts-Fatty & Rosin Acid | Aglaonema | 18985A |
| • Clethodim | Purple Coneflower (Echinacea) | 17254A | • Copper Salts-Fatty & Rosin Acid | Aglaonema | 19004A |

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
|-----------------------------------|--|------------|---|--|------------|
| • Copper Salts-Fatty & Rosin Acid | Cherry (Non-Bearing) (Prunus sp.) | 19016A | • Copper Salts-Fatty & Rosin Acid | Zinnia | 19014A |
| • Copper Salts-Fatty & Rosin Acid | Cherry (Non-Bearing) (Prunus sp.) | 19019A | • Dithiopyr (WSP) | Lily-Of-The-Nile (Agapanthus) | 18742A |
| • Copper Salts-Fatty & Rosin Acid | Dogwood, Flowering (<i>Cornus florida</i>) | 19017A | • Dithiopyr (WSP) | Shrub Verbena (Lantana) | 18750A |
| • Copper Salts-Fatty & Rosin Acid | Dogwood, Flowering (<i>Cornus florida</i>) | 19020A | • Dithiopyr (WSP) | Viburnum (Viburnum suspensum) | 18756A |
| • Copper Salts-Fatty & Rosin Acid | Dumb Cane (Dieffenbachia) | 18975A | • Fenhexamid | Daffodil (Narcissus) | 17205A |
| • Copper Salts-Fatty & Rosin Acid | Dumb Cane (Dieffenbachia) | 18994A | • Fenhexamid | Lily (Lilium) | 17202A |
| • Copper Salts-Fatty & Rosin Acid | Geranium (Geranium sp.) | 18983A | • Fenhexamid | Lily (Lilium) | 17203A |
| • Copper Salts-Fatty & Rosin Acid | Geranium (Geranium sp.) | 19002A | • Fenpropathrin | Ash (Fraxinus) | 21691A |
| • Copper Salts-Fatty & Rosin Acid | Geranium (Geranium sp.) | 19021A | • Fenpropathrin | Ash (Fraxinus) | 21692A |
| • Copper Salts-Fatty & Rosin Acid | Geranium (Pelargonium) | 18982A | • Fenpropathrin | Crabapple (Non-Bearing) (Malus) | 21689A |
| • Copper Salts-Fatty & Rosin Acid | Geranium (Pelargonium) | 19001A | • Fenpropathrin | Crabapple (Non-Bearing) (Malus) | 21690A |
| • Copper Salts-Fatty & Rosin Acid | Lily, Plantain (Hosta) | 19015A | • Fenpropathrin | Honey Locust (Gleditsia) | 21693A |
| • Copper Salts-Fatty & Rosin Acid | Lily, Plantain (Hosta) | 19018A | • Fenpropathrin | Honey Locust (Gleditsia) | 21694A |
| • Copper Salts-Fatty & Rosin Acid | Mallow, Rose Mallow (Hibiscus) | 19013A | • Fenpropathrin | Hydrangea | 21685A |
| • Copper Salts-Fatty & Rosin Acid | Pansy (Viola) | 18989A | • Fenpropathrin | Hydrangea | 21686A |
| • Copper Salts-Fatty & Rosin Acid | Pansy (Viola) | 19008A | • Fenpropathrin | Spirea (Spiraea) | 21687A |
| • Copper Salts-Fatty & Rosin Acid | Patience Plant, Zanzibar Balsam (<i>Impatiens wallerana</i>) | 18973A | • Fenpropathrin | Spirea (Spiraea) | 21688A |
| • Copper Salts-Fatty & Rosin Acid | Patience Plant, Zanzibar Balsam (<i>Impatiens wallerana</i>) | 18992A | • Fludioxonil | Ash (Fraxinus) | 21414A |
| • Copper Salts-Fatty & Rosin Acid | Poinsettia (<i>Euphorbia pulcherrima</i>) | 18988A | • Fludioxonil | Cherry (Non-Bearing) (Prunus sp.) | 21416A |
| • Copper Salts-Fatty & Rosin Acid | Poinsettia (<i>Euphorbia pulcherrima</i>) | 19007A | • Fludioxonil | Crabapple (Non-Bearing) (Malus) | 21412A |
| • Copper Salts-Fatty & Rosin Acid | Rose (Rosa) | 21399A | • Fludioxonil | Magnolia | 21410A |
| • Copper Salts-Fatty & Rosin Acid | Rose Periwinkle (<i>Catharanthus roseus</i>) | 18978A | • Fludioxonil | Maple (Acer) | 21411A |
| • Copper Salts-Fatty & Rosin Acid | Rose Periwinkle (<i>Catharanthus roseus</i>) | 18997A | • Fludioxonil | Oak (Quercus) | 21413A |
| • Copper Salts-Fatty & Rosin Acid | Snapdragon (<i>Antirrhinum majus</i>) | 18976A | • Fludioxonil | Peach (Non-Bearing) (<i>Prunus persica</i>) | 21415A |
| • Copper Salts-Fatty & Rosin Acid | Snapdragon (<i>Antirrhinum majus</i>) | 18995A | • Fomesafen | Rose (Rosa) | 21409A |
| • Copper Salts-Fatty & Rosin Acid | Spathe Flower (Spathiphyllum) | 18977A | • Fomesafen | Arrowwood (Viburnum) | 10056A |
| • Copper Salts-Fatty & Rosin Acid | Spathe Flower (Spathiphyllum) | 18996A | • Fomesafen | Boxwood (Buxus) | 10052A |
| • Copper Salts-Fatty & Rosin Acid | Vervain (Verbena) | 18974A | • Fomesafen | Cherry (Non-Bearing) (Prunus sp.) | 10054A |
| • Copper Salts-Fatty & Rosin Acid | Vervain (Verbena) | 18993A | • Fomesafen | Crape Myrtle (<i>Lagerstroemia indica</i>) | 10055A |
| | | | • Fomesafen | Photinia | 10051A |
| | | | • Fomesafen | Privet (Ligustrum) | 10053A |
| | | | • <i>Gliocladium catenulatum</i> Strain J1146 | Cedar, Western Red (<i>Thuja plicata</i>) | 21088A |
| | | | • <i>Gliocladium catenulatum</i> Strain J1146 | Fir (Abies) | 21086A |
| | | | • <i>Gliocladium catenulatum</i> Strain J1146 | Fir, Douglas (<i>Pseudotsuga menziesii</i>) | 21085A |
| | | | • <i>Gliocladium catenulatum</i> Strain J1146 | Hemlock, Western (<i>Tsuga heterophylla</i>) | 21087A |
| | | | • <i>Gliocladium catenulatum</i> Strain J1146 | Pansy (Viola) | 18821A |
| | | | • Imazapic | Annual Phlox (<i>Phlox drummondii</i>) | 21143A |
| | | | • Imazapic | Black-Eyed Susan (<i>Rudbeckia hirta</i>) | 16785A |
| | | | • Imazapic | Black-Eyed Susan (<i>Rudbeckia hirta</i>) | 20933A |

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
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| • Imazapic | Black-Eyed Susan (<i>Rudbeckia hirta</i>) | 20936A | • Pendimethalin | Bellflower (Campanula) | 19593A |
| • Imazapic | Lance Coreopsis (<i>Coreopsis lanceolata</i> L.) | 20937A | • Pendimethalin | Blanket Flower (Gaillardia) | 19451A |
| • Iprodione | African Violet (Saintpaulia) | 07061A | • Pendimethalin | California Fuschia (<i>Zauschneria californica</i>) | 20151A |
| • Iprodione | Balsam (Impatiens) | 07283A | • Pendimethalin | Cypress (Cupressus) | 19471A |
| • Iprodione | Balsam (Impatiens) | 07287A | • Pendimethalin | Daylily (Hemerocallis) | 19435A |
| • Isoxaben | Butchers Broom, Israeli | 11271A | • Pendimethalin | Elm, Chinese (<i>Ulmus parvifolia</i>) | 12911A |
| • Isoxaben | Ruscus (<i>R. aculeatus</i>) | | • Pendimethalin | Elm, Winged (<i>Ulmus alata</i>) | 11019A |
| • Isoxaben | Cypress, Leyland (<i>Cupressocyparis leylandii</i>) | 10987A | • Pendimethalin | Elm, Winged (<i>Ulmus alata</i>) | 11022A |
| • Isoxaben | Cypress, Leyland (<i>Cupressocyparis leylandii</i>) | 10988A | • Pendimethalin | Fern, Hayscented (<i>Dennstaedtia punctilobula</i>) | 11591A |
| • Isoxaben | Cypress, Leyland (<i>Cupressocyparis leylandii</i>) | 12752A | • Pendimethalin | Foxglove (Digitalis) | 19432A |
| • Isoxaben | Fern, Tree (<i>Asparagus virgatus</i>) | 11274A | • Pendimethalin | Gayfeather (<i>Liatris spicata</i>) | 19453A |
| • Isoxaben | Hardy Ice Plant (<i>Delosperma nubigenum</i>) | 11791A | • Pendimethalin | Geranium (Geranium sp.) | 19433A |
| • Isoxaben | Ribbon-Grass, Gardeners-Garters (<i>Phalaris arundinacea</i>) | 20158A | • Pendimethalin | Honeysuckle (Lonicera) | 19480A |
| • Isoxaben | Serviceberry (Amelanchier) | 12466A | • Pendimethalin | Japanese Iris (Iris Kaempferi) | 11592A |
| • Isoxaben | St.-Johns-Wort (Hypericum) | 18825A | • Pendimethalin | Jasmine, Star; | 19495A |
| • Isoxaben | Yarrow (Achillea Millifolium) | 10743A | • Pendimethalin | Confederate (<i>Trachelo- spermum jasminoides</i>) | |
| • Isoxaben + Trifluralin | Fern, Tree (<i>Asparagus virgatus</i>) | 11286A | • Pendimethalin | Moonbeam, Tickseed (<i>Coreopsis verticillata</i>) | 19594A |
| • Isoxaben + Trifluralin | Palm, Pygmy Date (<i>Phoenix roebelenii</i>) | 19615A | • Pendimethalin | Periwinkle (Vinca) | 19442A |
| • Isoxaben + Trifluralin | Sedge (Carex) | 20788A | • Pendimethalin | Pinks (Dianthus) | 19448A |
| • Isoxaben + Trifluralin | Sedge (Carex) | 20809A | • Pendimethalin | Plum (Non-Bearing) (Prunus sp.) | 19487A |
| • Oryzalin | Cheddar Pink (<i>Dianthus gratianopolitanus</i>) | 12124A | • Pendimethalin | Purple Coneflower (Echinacea) | 19449A |
| • Oryzalin | Crape Myrtle (<i>Lager- stroemia indica</i> x Fauriei) | 12810A | • Pendimethalin | Sage, Scarlet (<i>Salvia splendens</i>) | 19440A |
| • Oryzalin | English Lavender (<i>Lavandula angustifolia</i>) | 11617A | • Pendimethalin | Shrub Verbena (Lantana) | 19479A |
| • Oryzalin | Fern, Japanese Painted (<i>Athyrium goeringianum</i>) | 11608A | • Pendimethalin | Silver Mound (<i>Artemisia schmidtiana</i>) | 19445A |
| • Oryzalin | Speedwell, Brooklime (Veronica) | 10760A | • Pendimethalin | Statice (Limonium) | 19441A |
| • Oxadiazon (G) | Butterfly Bush, Silver (<i>Buddleia alternifolia</i>) | 20141A | • Pendimethalin | White Fringetree (<i>Chionanthus retusus</i>) | 12881A |
| • Pendimethalin | Ageratum | 19427A | • Pendimethalin | Witch Alder (<i>Fothergilla gardenii</i>) | 12885A |
| • Pendimethalin | Baby's-Breath (<i>Gypsophila elegans</i>) | 19434A | • Pendimethalin | Yarrow (<i>Achillea millifolium</i>) | 19444A |
| • Pendimethalin | Beard-Tongue (Penstemon sp.) | 19438A | • Pendimethalin | Zinnia | 19443A |
| • Pendimethalin | Begonia | 19428A | • Pyridaben | Ash (Fraxinus) | 16403A |
| | | | • Pyridaben | Ash (Fraxinus) | 16676A |
| | | | • Pyridaben | Baby's-Breath (<i>Gypsophila elegans</i>) | 16481A |
| | | | • Pyridaben | Baby's-Breath (<i>Gypsophila elegans</i>) | 16754A |
| | | | • Pyridaben | Bald Cypress (<i>Taxodium distichum</i>) | 16326A |
| | | | • Pyridaben | Bald Cypress (<i>Taxodium distichum</i>) | 16599A |

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
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| • Pyridaben | Balloon Flower (<i>Platycodon grandiflorus</i>) | 16520A | • Pyridaben | Fir, Douglas (<i>Pseudotsuga menziesii</i>) | 16592A |
| • Pyridaben | Balloon Flower (<i>Platycodon grandiflorus</i>) | 16793A | • Pyridaben | Foxglove (<i>Digitalis</i>) | 16461A |
| • Pyridaben | Bee Balm (<i>Monarda didyma</i>) | 16508A | • Pyridaben | Foxglove (<i>Digitalis</i>) | 16734A |
| • Pyridaben | Bee Balm (<i>Monarda didyma</i>) | 16781A | • Pyridaben | Franklin Tree (<i>Franklinia</i>) | 16402A |
| • Pyridaben | Birch (<i>Betula</i>) | 16334A | • Pyridaben | Franklin Tree (<i>Franklinia</i>) | 16675A |
| • Pyridaben | Birch (<i>Betula</i>) | 16607A | • Pyridaben | Gaura (<i>Gaura lindheimeri</i>) | 16477A |
| • Pyridaben | Blanket Flower (<i>Gaillardia</i>) | 16475A | • Pyridaben | Gaura (<i>Gaura lindheimeri</i>) | 16750A |
| • Pyridaben | Blanket Flower (<i>Gaillardia</i>) | 16748A | • Pyridaben | Hemlock (<i>Tsuga</i>) | 16324A |
| • Pyridaben | Bleeding Heart (<i>Dicentra</i>) | 16460A | • Pyridaben | Hemlock (<i>Tsuga</i>) | 16597A |
| • Pyridaben | Bleeding Heart (<i>Dicentra</i>) | 16725A | • Pyridaben | Hollyhock (<i>Alcea rosea</i>) | 16426A |
| • Pyridaben | Butterfly Bush (<i>Buddleia davidii</i>) | 16335A | • Pyridaben | Hollyhock (<i>Alcea rosea</i>) | 16699A |
| • Pyridaben | Butterfly Bush (<i>Buddleia davidii</i>) | 16608A | • Pyridaben | Japanese Andromeda (<i>Pieris japonica</i>) | 16301A |
| • Pyridaben | Camellia, Mountain (<i>Stewartia</i>) | 16381A | • Pyridaben | Japanese Andromeda (<i>Pieris japonica</i>) | 16574A |
| • Pyridaben | Camellia, Mountain (<i>Stewartia</i>) | 16654A | • Pyridaben | Lady's-Mantle (<i>Alchemilla</i>) | 16428A |
| • Pyridaben | Coneflower (<i>Rudbeckia</i>) | 16463A | • Pyridaben | Lady's-Mantle (<i>Alchemilla</i>) | 16701A |
| • Pyridaben | Coneflower (<i>Rudbeckia</i>) | 16526A | • Pyridaben | Lamb's-Ears (<i>Stachys byzantina</i>) | 16533A |
| • Pyridaben | Coneflower (<i>Rudbeckia</i>) | 16736A | • Pyridaben | Lamb's-Ear (<i>Stachys byzantina</i>) | 16806A |
| • Pyridaben | Coneflower (<i>Rudbeckia</i>) | 16799A | • Pyridaben | Lily, Plantain (<i>Hosta</i>) | 16489A |
| • Pyridaben | Corn Flag, Sword Lily (<i>Gladiolus</i>) | 16480A | • Pyridaben | Lily, Plantain (<i>Hosta</i>) | 16762A |
| • Pyridaben | Corn Flag, Sword Lily (<i>Gladiolus</i>) | 16753A | • Pyridaben | Lupine (<i>Lupinus</i>) | 16504A |
| • Pyridaben | Cotoneaster | 16293A | • Pyridaben | Lupine (<i>Lupinus</i>) | 16777A |
| • Pyridaben | Cotoneaster | 16566A | • Pyridaben | Mallow (<i>Malva</i>) | 16507A |
| • Pyridaben | Crabapple (Non-Bearing) (<i>Malus</i>) | 19157A | • Pyridaben | Mallow (<i>Malva</i>) | 16780A |
| • Pyridaben | Crape Myrtle (<i>Lagerstroemia indica</i>) | 16363A | • Pyridaben | Maple (<i>Acer</i>) | 16328A |
| • Pyridaben | Crape Myrtle (<i>Lagerstroemia indica</i>) | 16636A | • Pyridaben | Mugwort, Wormwood (<i>Artemisia</i>) | 16434A |
| • Pyridaben | Deutzia | 16346A | • Pyridaben | Mugwort, Wormwood (<i>Artemisia</i>) | 16707A |
| • Pyridaben | Deutzia | 16619A | • Pyridaben | Oak (<i>Quercus</i>) | 16413A |
| • Pyridaben | False Dragon Head, Lion's Heart (<i>Physostegia</i>) | 16519A | • Pyridaben | Oak (<i>Quercus</i>) | 16686A |
| • Pyridaben | False Dragon Head, Lion's Heart (<i>Physostegia</i>) | 16792A | • Pyridaben | Oregon Grape (<i>Mahonia aquifolium</i>) | 16368A |
| • Pyridaben | False Spirea (<i>Astilbe</i>) | 16437A | • Pyridaben | Oregon Grape (<i>Mahonia aquifolium</i>) | 16641A |
| • Pyridaben | False Spirea (<i>Astilbe</i>) | 16710A | • Pyridaben | Peony (<i>Paeonia</i>) | 16513A |
| • Pyridaben | Fern (<i>Polypodium</i>) | 16469A | • Pyridaben | Peony (<i>Paeonia</i>) | 16786A |
| • Pyridaben | Fern (<i>Polypodium</i>) | 16742A | • Pyridaben | Pine (<i>Pinus</i>) | 16302A |
| • Pyridaben | Fir, Douglas (<i>Pseudotsuga menziesii</i>) | 16319A | • Pyridaben | Pine (<i>Pinus</i>) | 16575A |
| | | | • Pyridaben | Poker Plant, Red-Hot-Poker (<i>Kniphofia</i>) | 16493A |
| | | | • Pyridaben | Poker Platn, Red-Hot-Poker (<i>Kniphofia</i>) | 16766A |
| | | | • Pyridaben | Reed Grass (<i>Calamagrostis arundinaecea</i>) | 16546A |
| | | | • Pyridaben | Reed Grass (<i>Calamagrostis arundinaecea</i>) | 16819A |

| Pest Control Agent | Commodity | PR# | Pest Control Agent | Commodity | PR# |
|---------------------------|---|------------|---------------------------|---|------------|
| • Pyridaben | Ribbon-Grass, Gardeners-Garters (<i>Phalaris arundinacea</i>) | 16562A | • S-Metolachlor | Blanket Flower (Gaillardia) | 11121A |
| • Pyridaben | Ribbon-Grass, Gardeners-Garters (<i>Phalaris arundinacea</i>) | 16835A | • S-Metolachlor | Fir, Douglas (<i>Pseudotsuga menziesii</i>) | 10298A |
| • Pyridaben | Serviceberry (Amelanchier) | 16330A | • S-Metolachlor | Heavenly Bamboo (<i>Nandina domestica</i>) | 07410A |
| • Pyridaben | Serviceberry (Amelanchier) | 16603A | • S-Metolachlor | Oak, Live; Southern (<i>Quercus virginiana</i>) | 10934A |
| • Pyridaben | Shasta Daisy (Chrysanthemum x superbum) | 16498A | • S-Metolachlor | Palm, Mexican Fan (<i>Washingtonia robusta</i>) | 13437A |
| • Pyridaben | Shasta Daisy (Chrysanthemum x superbum) | 16771A | • S-Metolachlor | Pine, Longleaf (<i>Pinus palustris</i>) | 10935A |
| • Pyridaben | Smoke Tree; Bush (Cotinus) | 16401A | • S-Metolachlor | Sweet William (<i>Dianthus barbatus</i>) | 09730A |
| • Pyridaben | Smoke Tree; Bush (Cotinus) | 16674A | • Triazamate | Fir, Balsam (<i>Abies balsamea</i>) | 21034A |
| • Pyridaben | Spiderwort (Tradescantia) | 16539A | • Triazamate | Fir, Balsam (<i>Abies balsamea</i>) | 21035A |
| • Pyridaben | Spiderwort (Tradescantia) | 16812A | • Triazamate | Fir, Cannan (Abies) | 21038A |
| • Pyridaben | St.-Johns-Wort (Hypericum) | 16359A | • Triazamate | Fir, Cannan (Abies) | 21039A |
| • Pyridaben | St.-John-Wort (Hypericum) | 16632A | • Triazamate | Fir, Concolor (Abies) | 21040A |
| • Pyridaben | Stonecrop (<i>Sedum spurium</i>) | 16529A | • Triazamate | Fir, Concolor (Abies) | 21041A |
| • Pyridaben | Stonecrop (<i>Sedum spurium</i>) | 16802A | • Triazamate | Fir, Fralsam (Abies) | 21042A |
| • Pyridaben | Sweet Pea (<i>Lathyrus odoratus</i>) | 16496A | • Triazamate | Fir, Fralsam (Abies) | 21043A |
| • Pyridaben | Sweet Pea (<i>Lathyrus odoratus</i>) | 16769A | • Triazamate | Fir, Fraser (Abies) | 21036A |
| • Pyridaben | Sweetgum (Liquidambar) | 16365A | • Triazamate | Fir, Fraser (Abies) | 21037A |
| • Pyridaben | Sweetgum (Liquidambar) | 16638A | • Trifloxystrobin | Calamint (Calamintha) | 14442A |
| • Pyridaben | Sycamore (Platanus) | 16411A | • Trifluralin | African Daisy (Osteospermum) | 18715A |
| • Pyridaben | Sycamore (Platanus) | 16684A | • Trifluralin | Beard-Tongue (Penstemon sp.) | 12134A |
| • Pyridaben | Tickseed (Coreopsis) | 16453A | • Trifluralin | Blazing-Star, Gayfeather (Liatris) | 13313A |
| • Pyridaben | Tickseed (Coreopsis) | 16726A | • Trifluralin | Bleeding Heart (Dicentra) | 08394A |
| • Pyridaben | Tulip Tree (<i>Liriodendron tulipifera</i>) | 16409A | • Trifluralin | Fern, Uncrested Lady (Athyrrium) | 17844A |
| • Pyridaben | Tulip Tree (<i>Liriodendron tulipifera</i>) | 16682A | • Trifluralin | Foxglove (Digitalis) | 11178A |
| • Pyridaben | Weigela | 16386A | • Trifluralin | Foxglove (Digitalis) | 11179A |
| • Pyridaben | Weigela | 16659A | • Trifluralin | Palm, Mexican Fan (<i>Washingtonia robusta</i>) | 13452A |
| • Pyridaben | White Fringetree (<i>Chionanthus retusus</i>) | 16398A | • Trifluralin | Palm, Pygmy Date (<i>Phoenix roebelenii</i>) | 13451A |
| • Pyridaben | White Fringetree (<i>Chionanthus retusus</i>) | 16671A | • Trifluralin | Purp Coneflower (Echinacea) | 18605A |
| • Pyridaben | Willow (Salix) | 16377A | • Trifluralin | Ribbon-Grass, Gardeners-Garters (<i>Phalaris arundinacea</i>) | 10663A |
| • Pyridaben | Willow (Salix) | 16650A | • Trifluralin | Sage, Russian; Blue Spire (Perovskia) | 13315A |
| • Pyridaben | Witch Hazel (Hamamelis) | 16357A | • Trifluralin | Sage, Russian; Blue Spire (Perovskia) | 18615A |
| • Pyridaben | Witch Hazel (Hamamelis) | 16630A | | | |
| • Pyridaben | Yew (Taxus) | 16321A | | | |
| • Pyridaben | Yew (Taxus) | 16594A | | | |

Attachment 9

Biopesticide Research and Development – 2002

Biopesticide Petitions/Amendments/Data Packages Submitted to EPA or Manufacturer in 2002.

- PR #0200B Yeast hydrolysate for greasy spot and fruit drop in citrus and bacterial leaf spot in tomato

Submitted amended Section 3 petition on behalf of Morse Enterprises.

- PR #0052B *Aspergillus flavus* AF-36 for reducing aflatoxin in cotton

Submitted expanded EUP on behalf of USDA-ARS Dr. Peter Cotty to include the state of Texas.

- PR #160B Thymol (Api Life VAR) for control of Varroa mite in honey bees

Submitted amended Section 3 data package on behalf of Brushy Mountain Bee Farm.

- PR #0088B Sodium metasilicate (TRIAD) for the control of soft bodied insects and powdery mildew

Submitted Section 3 and EUP registration package on behalf of Environmentally Safe Systems.

- PR #0086B *Verticillium dahliae* WCD 850 (Dutch Trig) for the control of Dutch Elm disease

Submitted amended Section 3 registration on behalf of ARCADIS.

IR-4

2002 ANNUAL REPORT

IR-4 Project
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01/03