In 1990, the Washington State legislature acted on a vision that would provide the citizens of Washington enhanced protection of their food supply and environment. A provision for the establishment of “a food and environmental quality laboratory” was created under Title 15, Chapter 92, Section 050 (of the Revised Code of Washington (RCW 15.92.050). This new laboratory would be “operated by Washington State University...in the Tri-Cities area to conduct pesticide residue studies concerning fresh and processed foods, in the environment, and for human and animal safety.”

The following section, RCW 15.92.060, set forth the responsibilities of the laboratory, to include:

- Evaluating regional requirements for minor crop registrations through the federal IR-4 program;
- Providing a program for tracking the availability of effective pesticides for minor crops, minor uses, and emergency uses in this state;
- Conducting studies on the fate of pesticides on crops and in the environment, including soil, air, and water;
- Improving pesticide information and education programs;
- Assisting federal and state agencies with questions regarding registration of pesticides which are deemed critical to crop production, consistent with priorities established in RCW 15.92.070; and
- Assisting in the registration of biopesticides, pheromones, and other alternative chemical and biological methods.
The bottom line? Enhancing sustainability of quality food production and environmental stewardship.

Washington State ranks third nationally in the production of minor crops behind only California and Florida. We produce over 240 different crops in this state and are nationally recognized for growing a wide range of high-value crops on comparatively small acreages.

One of the reasons such important crops are called “minor” is that the volume of each individual crop produced is not always large enough to justify commercial development and/or registration of pest controls. Yet minor crops have complex pest management requirements. The Food and Environmental Quality Laboratory (FEQL) has taken an active role in supporting the production of minor crops in Washington in the course of fulfilling its legislative mandates.

❖ Developing and aiding registration of new and reduced-risk pest control technologies.
❖ Conducting field and laboratory research to determine safety and efficacy of various traditional and alternative pest control strategies.
❖ Operating the Washington State Pest Management Resource Service (WSPRS) to communicate information on pest control needs and developments.
❖ Teaching, training, and outreach through Extension programs, industry and service group presentations, and the classroom.

Minor crops aren’t really so minor. They include most of the fruits and vegetables we eat every day, plus nuts, berries, herbs, nursery plants, and ornamentals. Together, they account for some $40 billion in annual farmgate value in the U.S. and between $2 billion and $3 billion in Washington.
Applying Science to Real-World Agricultural Issues

“Assisting in the registration of biopesticides, pheromones, and other alternative chemical and biological methods...”

RCW 15.92.060, Item 6

FEQL faculty have been directly responsible for

- Registration of imidacloprid and spinosad, both low-risk compounds, for control of cherry fruit fly on cherries and stone fruit
- Expediting registration of an entire new group of “softer” miticides (ones that don’t affect beneficial predator insects) for use in grapes, pears, and mint
- Encouraging registration of low-toxicity imidacloprid as a seed treatment in carrots, resulting in 4,000 lbs. less annual use of the more toxic diazinon
- Assisting Washington tree fruit growers by performing state-of-the-art pheromone release evaluations for improved biological control of their #1 insect pest, the codling moth
- Increasing returns for Washington wine grape growers by $5.5 million per year by introducing an application technique that reduces insecticide use by 25,000 lbs. per year industrywide

Reduction of chlorpyrifos use by 54,000 lbs. annually by introducing the hybrid poplar industry to pheromone mating disruption
"Conducting studies on the fate of pesticides on crops and in the environment, including soil, air, and water..."
RCW 15.92.060, Item 3

What happens to pesticides after we apply them to our crops and lawns? FEQL works constantly to determine the answer to this question through laboratory and field science studies. Projects have included:

- measuring off-target residue movement (drift) and searching for ways to minimize it,
- working cooperatively with different commodity groups to solve pesticide use problems and conflicts,
- evaluating antiseptics in milk after treatment of dairy cattle,
- characterizing the contents of the stomachs of waterfowl following environmental exposure,
- participating in the development of novel analytical methods for determining children’s exposure to organophosphate pesticides,
- examining rate of residue degradation on fruit and foliage,
- monitoring pesticide residues in ambient air, and
- other studies characterizing the fate of trace-level organics in the air and water, in human and animal subjects, and in the soil.
Spreading the Word to Those Who Need to Know

“Assisting federal and state agencies with questions regarding registration of pesticides which are deemed critical to crop production...”

RCW 15.92.060
Item 5

One formal way in which FEQL/WSPRS assists agencies with questions is via the Pacific Northwest Comment Coordinator. This position was created and federally funded in 2003 to facilitate communication between the “agricultural front lines” (growers, commodity groups, researchers, Extension) and the U.S. Department of Agriculture/U.S. Environmental Protection Agency. When USDA or EPA needs information, they turn to the Western Integrated Pest Management Center, which turns to the PNW Comment Coordinator, housed in the WSPRS office. The Comment Coordinator works with the agricultural stakeholders in six Western states to provide answers.
Washington State Pest Management Resource Service (WSPRS) provides a searchable web-based database containing information on the nearly 12,000 pesticide labels registered in Washington and Oregon. This database, Pesticide Information Center On-Line or PICOL, is provided free to users via funding from Washington State Department of Agriculture, Washington State University, Oregon Department of Agriculture, and Oregon State University. Growers, field consultants, Extension staff, and the general public use the label database to determine which pesticides are legally registered for use. PICOL also contains tolerance information (the maximum levels of pesticide residues allowed) for food, fiber, and feed crops produced in the Pacific Northwest. Nearly 10,000 pesticide tolerances are paired in crop/chemical combinations. Food processors and other groups use the tolerance database as a reference check on incoming raw commodities.

“Improving pesticide information and education programs...”

RCW 15.92.060. Item 4

The four FEQL faculty members and their staffs provided over 40,000 contact hours of Extension (public education) presentations from 2000 to 2003.

There's more to information dissemination than providing a list of registered pesticides.
“Providing a program for tracking the availability of effective pesticides for minor crops, minor uses, and emergency uses in this state...”

RCW 15.92.060, Item 2

The Pesticide Notification Network (PNN) is a service developed by WSU under contract with the Washington State Commission on Pesticide Registration (WSCPR). The PNN tracks the status of pesticide registrations for minor crops and emergency uses in the state of Washington, then uses a targeted distribution system to inform those affected by each registration addition, deletion, or label change. Subscribers, including individual growers, commodity commissions, other grower groups, and university Extension personnel, “customize” their subscription so they receive only the information relevant to their particular crop and pest needs. Since its inception in 1997, the PNN has expanded in scope to include a web page that enables both subscribers and the general public to search and review past PNN transmissions and to view electronic copies of Section 18 and 24c labels. PNN services are free to users.
The IR-4 Project
Providing Safe and Effective Pest Management Solutions for Specialty Crop Growers

USDA’s Interregional Research Project #4 (IR-4) works with growers, scientists, and commodity organizations to identify minor crop pest control needs. The requests are prioritized at an annual workshop after which research assignments are made. IR-4 liaisons at each state’s land grant university play a key role in determining research priorities.

The IR-4 Project has been extraordinarily successful since its founding in 1964, with over 7,300 food use clearances, 10,600 ornamentals clearances and over 300 biopesticide clearances to its credit. In response to the 1996 Food Quality Protection Act, reduced risk and safer chemistry projects now account for 80% of IR-4’s research. Since 2001, IR-4’s petitions comprised 50% of the total number approved by EPA.

The FEQL is involved with IR-4 in several ways. First, the Washington State IR-4 liaison is a member of the FEQL faculty. His participation in the annual prioritization workshop helps ensure that Washington’s minor crop needs are addressed. Second, FEQL’s analytical laboratory performs food crop residue evaluations adherent to the rigorous Good Laboratory Practices (GLP) standards required by IR-4. Finally, FEQL faculty and staff direct and operate the IR-4 field research center that serves eastern Washington, eastern Oregon, and most of Idaho.

IR-4 FEQL Success
Powdery mildew costs the state’s cherry industry millions of dollars. WSU researchers leveraged resources to obtain registration of quinoxyfen 2 years sooner than the registrant had planned.

Of the approximately 181 specific crop-and-pesticide combinations submitted to EPA through the IR-4 program on behalf of Washington State growers since 1994:

- 18 have been cancelled by registrant
- 105 have been registered or reregistered or have had a tolerance established
- 11 have received Section 18s or 24Cs

“Evaluating regional requirements for minor crop registrations through the federal IR-4 program...”

RCW 15.92.060, Item 1
The state legislature, in its mandate for the Food and Environmental Quality Laboratory, set forth certain requirements for its advisory board to ensure a broad spectrum of stakeholder representation. Seventeen specific constituencies are represented on the FEQL Advisory Board; these positions are listed to the right. Board members serve three-year terms. A list of current board members can be found on the FEQL web page at http://feql.wsu.edu/

Note: The crops listed in pale print on these angled color blocks throughout this report are all crops on which one or more of the FEQL faculty has worked. These crops, from apricot to zinnia, illustrate the scope and importance of minor crops as well as the breadth of experience of FEQL’s dedicated faculty.
Dr. Catherine Daniels is Washington State’s Pesticide Coordinator and founder/director of WSPRS, the Washington State Pest Management Resource Service. She facilitates communication between agricultural interests and the state, regional, and national entities involved in pesticide issues. WSPRS maintains the PICOL, PNN, and WSPRS websites, serving as a hub for research-based information on chemical and alternative pest control methodologies. Dr. Daniels oversees review of all Washington State University documents involving the use of pesticides and serves as Washington State’s representative to USDA’s Western Integrated Pest Management Center.

Dr. Allan Felsot is a Professor in the Department of Entomology at Washington State University and acts as the Environmental Toxicologist for the FEQL. He is active in numerous state, national, and international science and advisory organizations including the Washington State Pesticide Incident Reporting and Tracking Panel, the American Chemical Society, and the International Union for Pure and Applied Chemistry. Dr. Felsot is a prolific author, speaker, and teacher whose work puts a human face on the FEQL for a wide diversity of audiences.

Dr. Douglas Walsh is an Associate Professor in WSU’s Department of Entomology and Principal Investigator for the Environmental and Agricultural Entomology Laboratory. As the entomology specialist on many of Washington State’s minor crops, his environmental and applied pest management research provides growers and landowners with real-world pest management practices. Dr. Walsh serves as IPM Coordinator for WSU, as an ex-officio commissioner on the Washington State Commission on Pesticide Registration, as the State Liaison Representative to the USDA IR-4 project, and as director of the EPA Region 10 Field Research Center for IR-4 for Magnitude of Pesticide Registration Studies.

Dr. Vincent Hebert is the IR-4 Research Director for FEQL’s trace-level analytical research facility and an Assistant Professor at WSU. His GLP Magnitude of the Residue studies directly support minor crop agriculture in the Pacific Northwest. Dr. Hebert’s professional interests include characterizing the environmental fate of organic residues in air, surface waters, soils, and biotic matrices. His research includes monitoring off-target airborne pesticide residues (a.k.a. “drift”), refinement of codling moth mating disruption practices, and characterizing pesticide exposure among children of farm families living in agricultural communities.