

Impact

Sharing the difference CSU Extension makes in people's lives and their communities.

Integrated strategies lead to better pest management

Advances in communications technology along with weather, pest and disease data collection help farmers shift their pest management activities from suppression to prevention.

Issue

Agricultural producers in Colorado face losses estimated at \$5-\$10 million per crop each year from insect pests, diseases and weeds. Mitigating these losses takes more than pesticides such as insecticides, herbicides and fungicides. Farmers need information and tools that help them handle potential or current pest outbreaks without harming the environment, people or crop values.

Extension's Response

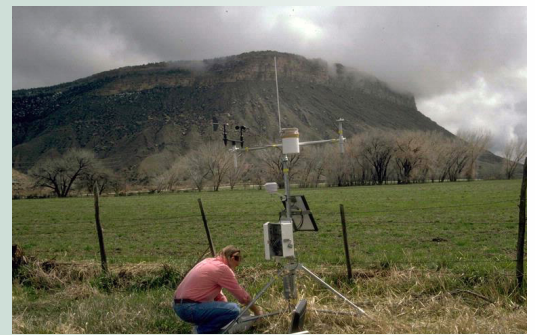
Since 1980, Howard Schwartz has worked with dry bean and onion farmers and crop consultants to minimize pest threats. Schwartz is one of 10 CSU Extension specialists who address pest management issues in the Colorado State University College of Agricultural Sciences department of bioagricultural sciences and pest management.

For decades, extension integrated pest management (IPM) education focused on pest suppression. Since the late 1990s, advances in technology have generated new tools and practices that emphasize prevention and mitigation as steps prior to costly control measures. Schwartz and his team have contributed to several of these efforts, including:

- Contributing to the development of the Colorado Agricultural Meteorological Network (CoAgMet) which collects weather data from more than 60 irrigated and dryland cropland stations statewide. Local weather data, uploaded to the CoAgMet website, helps growers and crop consultants forecast when and where outbreaks might occur and spread.
- Advancing the adoption of the dry bean and onion IPM Pest Information Platform for Extension and Education ("ipmPIPE"), a national online pest outbreak warning system. PIPEs provide information on the distribution and severity of diseases and insect pests that agricultural experts scout and report.
- Creating disease forecast models and yield loss studies that help dry bean and onion growers make locally-based and risk-rated pest management decisions.

Schwartz also provides comprehensive IPM education and training for CSU Extension agents, farmers and industry stakeholders. His activities include:

- Creating fact sheets, educational videos, diagnostic cards, newsletters and other publications.
- Sharing expertise at field days, demonstrations, workshops and educational meetings.
- Investigating new outbreaks of concern.
- Engaging the Colorado dry bean and onion associations in CSU research and extension. Formal and informal industry check-off programs annually generate \$40,000-\$50,000 for dry bean and onion research and education.



The Bottom Line

- CSU Extension supports Colorado's \$30 million onion and dry bean industries by helping growers adopt the most effective integrated pest management strategies available today.
- CSU Extension estimates that Colorado growers reduce pesticide inputs from improved IPM practices that stress outbreak reduction over absolute control.

By the Numbers

- Estimated annual return of IPM by Colorado onion and dry bean growers: \$4-\$5 million/crop
- Annual cost to maintain one CoAgMet weather station: \$1,000-\$2,000
- Colorado onion crop loss in 2003 due to the iris yellow spot virus outbreak: nearly \$5 million

Impact

Through Schwartz, CSU Extension has expanded Integrated Pest Management resources and practices that generate more accurate and timely information. Growers can then respond to potential and real pest outbreaks appropriately. Online management tools and resources have improved and increased interstate communications among extension IPM experts and facilitated early warnings about issues and threats that might travel to Colorado from neighboring states.

Schwartz's research and outreach have included:

- Communication networks that help growers and crop advisors forecast outbreaks.
 - Over the last 15 years Schwartz has improved the dissemination and distribution of IPM information. Previous pest management communications focused on sharing outbreak information with growers and crop consultants after the fact. Now a suite of communication tools—CoAgMet, ipmPIPEs, diagnostic cards, videos and more—offers cost-effective ways to monitor, avoid, prevent, and suppress pests, practices.
 - Schwartz notes, “If there is a threat I can put out an alert on PIPE warning growers, agents and advisors to scout their fields, look for early signs of disease and then appropriately respond.”
- Minimized crop loss.
 - The legume ipmPIPE reports that the project has generated a conservative return of 5 percent, or \$48 million (nationally) annually since 2006 by reducing legume losses from priority diseases and pests.
 - Similar economic returns have been provided by the onion ipmPIPE since its inception in 2010.
- Helped Colorado onion growers respond to a new, widespread and damaging pest.
 - In 2003, an outbreak of the iris yellow spot virus (IYSV)—transmitted to onions by thrips (a tiny insect)—that has cost Colorado onion growers an estimated \$2.5-\$5 million.
 - Schwartz and his team of assistants and students have been responsible for researching and developing resources and strategies to help onion growers, agents and farm advisors practice appropriate and effective pest management.
 - According to Schwartz, pests and diseases affecting dry beans have remained fairly stable but variable in intensity for the last 30 years. The arrival of the yellow spot virus required significant time, effort and collaboration to determine the most effective means of controlling it in onions.
- Minimized environmental impacts.
 - IPM strategies minimize environmental impacts through timely, appropriate and reduced application of pesticides. For example, scouting reports posted online through PIPEs include appropriate prevention, mitigation or control measures that vary according to different stages of plant growth, pest incidence and weather forecasts.

“For the first 15-20 years I wasn’t able to help farmers make a more timely decision to minimize the impact of a pest. Now with these new technologies and PIPEs we’re able to get word out to them within a few days that something is brewing out there so check your fields—and if you do find a problem, here’s something you can do right now to minimize your loss or protect your crop.”

– Howard Schwartz, CSU Extension specialist

A Matter of Economics

For integrated pest management to be effective, growers must combine several strategies: prevention, avoidance, monitoring and suppression. Applying IPM strategies should also make economic sense. Growers may decide that the cost of responding to a pest outbreak will be more than the crop revenue they might see from a response. In collaboration with private industry experts, Schwartz and other CSU Extension specialists have developed decision-making tools that help growers analyze comparative costs.

Learn More

The Colorado Agricultural Meteorological Network:
CoAgMet: <http://climate.colostate.edu/~coagmet/>

USDA ipmPIPEs project:
ipmPIPE: www.ipmpipe.org

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