

Partnership Matters

ISU Research and Extension

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IOWA STATE UNIVERSITY
CORN AND SOYBEAN
INITIATIVE

September 2006

RESEARCH BRIEF —

Bean pod mottle virus: A complicated pathogen

What's new. Bean pod mottle virus (BPMV) is a disease that reduces both yield and quality of harvested soybean. BPMV has traditionally been more of a southern soybean disease, but in the last decade, it has become more prevalent in Iowa. The virus can be carried from plant to plant by foraging leaf beetles (such as bean leaf beetles and soybean leaf miners). Once a plant is infected, there is no cure, and there are no BPMV-resistant soybean varieties currently known. Some varieties seem to tolerate the disease better, and research is continuing to understand better how the disease establishes and spreads within and between fields and from area to area. BPMV is of greatest concern to producers of specialty soybeans or seed bean producers, both crops that have higher market values than standard commercial soybean varieties. BPMV can be seed transmitted, but only at low rates, on



the order of 0.1 percent of seeds. However, even one plant in 1,000 means an infected seed lot can result in more than 100 infected plants per acre, possibly enough to provide a source for spread of the infection.



Top—A healthy seed (left) and a seed with a “bleeding hilum” or mottled seed (right). Bean pod mottle virus infection, in this case, was the causative agent.
Bottom—Soybean leaf showing puckering and mottling, typical virus-related symptoms.

ISU research. Just as there are different strains of influenza virus that cause the flu in humans, plant viruses also occur as different strains. Some strains are more damaging than others; sometimes infection by two or more strains can cause mild or moderate soybean damage individually, but when they infect a plant together, they can cause severe damage. Iowa State University researchers John Hill and Jeff Bradshaw are studying a previously unknown strain of

BPMV collected in Iowa from tick trefoil, a native legume that is an alternative host plant. This research should improve our understanding of how BPMV disease develops, in part, by learning how different strains infect plants through the season. This research is funded by the Iowa Soybean Association.

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ANNOUNCEMENT —

Gary Munkvold: A familiar face back with ISU

A familiar face returned to the Iowa State faculty on August 1 when Gary Munkvold started as seed pathologist. Munkvold will be conducting research and teaching students in his new position.

Munkvold served as extension plant pathologist at Iowa State from 1993 to 2003. Since then he was research coordinator for the Pathology, Entomology and Seed Science (PE/SS) group at Pioneer Hi-Bred International in Johnston, IA. While at Pioneer, his research activities included management and disease



development in agronomic crops, especially mycotoxin-producing ear rots; evaluation of corn hybrids for disease and insect resistance; and providing technical support on diseases and insects in agronomic crops for professionals in the company.

His research interests remain closely allied with applied production agriculture. Those interests include the causes and development of seed infection, control of seed and seedling diseases in the field and in storage and seed-health testing technologies. Seed health will continue to be of interest to Iowa agriculture, and Munkvold will be a key leader in researching practical solutions to disease issues involving the seed industry.

Munkvold is part of the faculty of the ISU Department of Plant Pathology, with his office and laboratory located in the Seed Science Center. The center is likely most familiar to agronomists in Iowa for the Seed Testing Lab, where the public can request tests that include germination and vigor testing, purity and noxious weed exams, genetic trait testing and overall seed health. But in addition to the testing service, considerable research is conducted there, and Munkvold brings real-world experience to the team.

Munkvold grew up in a suburb of Chicago and attended the University of Illinois, receiving his B.S. in forestry in 1986. He pursued plant pathology as a career path, earning the M.S. degree in plant pathology in 1988 at the University of Illinois, and then his Ph.D. in plant pathology at the University of California–Davis in 1992.

Bean pod mottle virus, continued—

What's next. Bradshaw is inoculating soybeans growing in a greenhouse with this BPMV strain collected from a Story County prairie adjacent to a soybean field. Although the tick trefoil appeared to show disease symptoms in the field, the strain caused late-developing, moderate symptoms in the soybeans. Examination of this strain may provide another clue about the early-season source for BPMV. Comparisons of this strain to known strains of BPMV are underway.

Additionally, research is being finalized that will reveal the effectiveness of various management strategies and tools that may lessen the impact of BPMV on soybean. This research concerns the use of seed treatments and the timing of foliar insecticides to reduce bean leaf beetle populations, thereby reducing the impact of BPMV on soybean.

Learn more. For the latest information, read the *Integrated Crop Management* newsletter at www.ipm.iastate.edu/ipm/icm. Summaries of these research results will be published there soon.



ISU BY THE NUMBERS —

Integrated Crop Management (ICM) newsletter

Individual articles published in 2005	177
Years published (as <i>Integrated Crop Management</i>)	14
Annual web hits for the online version.....	710,514
Pages published in 2005.....	222
Number of contributing authors in 2006 (as of 9/18)	54
Subscription cost (2006)	\$45
Number of annual issues.....	24
Number of special issues, 2006.....	2

For more information, contact Keven Arrowsmith, managing editor, e-mail karrows@iastate.edu or call 515-294-2405.

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ISU PROFILE —



Paula H. Flynn

- Extension program specialist, Plant Disease Clinic
- Instructor, Microbiology Program and Department of Plant Pathology

Origin

- Lake City, Minnesota, on scenic Lake Pepin (birthplace of waterskiing!)

Training

- B.S., Microbiology, Iowa State University, 1987
- M.S., Plant Pathology, University of Nebraska–Lincoln, 1989

At ISU

- Plant Disease Clinic diagnostician, 1989–present
- Teach undergraduate courses in plant disease diagnosis and introductory microbiology

Notable achievements

- Professional and Scientific Award for achievement and service, Iowa State University, College of Agriculture, 2001
- Meritorious service award, University Extension, 2002
- Award for 15 years of service in Extension, 2004
- Earned an Iowa secondary teaching certificate in biology, physical science, chemistry and general science

Personal

- Married to Joe; children Joey (12) and Christopher (10)
- Enjoy time with family and quilting, biking and landscaping with stones and dwarf conifers
- Earned 1,000-mile award with ISU Rec Milers, 2006

Favorite quote

“There’s more than one right answer.” —Dewitt Jones

... and justice for all

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