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Insects and Mites

Plant hosts for bean leaf beetle and bean pod mottle virus

by Jeffrey Bradshaw, Marlin E. Rice, and John Hill, Departments of Entomology
and Plant Pathology

Currently, little is known about the natural host range of bean pod mottle virus (BPMV) and bean leaf beetles in relation to seasonal disease development in soybean. By natural host range, we mean those plants that serve as hosts for bean leaf beetles and BPMV. There are two ways a plant can become infected with bean pod mottle virus: through the infected seed coat or by insects, especially bean leaf beetles. Researchers have found

many experimental host plants for BPMV that can be mechanically inoculated in a laboratory. However, in the field, a plant must be a host for the virus and the insect for BPMV to be carried from a wild host to soybean.

In the scientific literature, at least 13 host plants are reported for both BPMV and bean leaf beetles (Table 1). None of these hosts are alfalfa, red clover, and birdsfoot trefoil (*Integrated Crop Management*, June 23, 2003, page 97). Recently, Rayda Krell (an entomology graduate from Iowa State University) tested numerous plants in high BPMV areas, and using three different laboratory assays, she found only one to be positive for BPMV in Iowa, *Desmodium canadense*, or showy tick trefoil. Most of the plants in her study were only single samples; however, some, such as alfalfa, were tested more extensively and were found to test negative for BPMV. These research results indicate that many legumes may not be important in the disease cycle of BPMV. Furthermore, although *Desmodium* species are common in some regions in Iowa, the importance of these plants in the ecology



Showy tick trefoil is a known host of bean pod mottle virus and bean leaf beetle.

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Birdsfoot trefoil (yellow flowers) is not a known host of bean pod mottle virus or bean leaf beetle.

of BPMV is not known. Therefore, no management of wild hosts is recommended. We are continuing our research on the host range of BPMV and will keep you informed of our progress.

Jeffrey Bradshaw is a graduate research assistant studying bean leaf beetles. Marlin E. Rice is a professor of entomology with extension and research responsibilities in field and forage crops. John Hill is a professor in plant pathology.

Table 1. Host plants for bean pod mottle virus and bean leaf beetle.

BPMV Host Plant	Common Name
<i>Desmodium canadense</i>	Showy tick trefoil
<i>Desmodium paniculatum</i>	Panicled tick trefoil
<i>Glycine max</i>	Soybean
<i>Glycine soja</i>	Wild soybean
<i>Lespedeza cuneata</i>	Silky bush clover
<i>Lespedeza striata</i>	Common bush clover
<i>Lespedeza stipulacea</i>	Korean bush clover
<i>Phaseolus acutifolius</i>	Topiary bean
<i>Phaseolus lunatus</i>	Lima bean
<i>Phaseolus vulgaris</i>	Common bean
<i>Trifolium incarnatum</i>	Crimson clover
<i>Vigna sinensis</i>	Cowpea
<i>Vigna unguiculata</i>	Cowpea (African)



Red clover is not a known host of bean pod mottle virus or bean leaf beetle.



Plant Diseases

Disease scouting this summer

by XB Yang, Department of Plant Pathology

The weather since planting has been generally cooler than normal. The National Oceanic and Atmospheric Administration's weather forecast suggests a slightly better chance that temperatures may be below normal for July, with above-normal precipitation. Because the occurrence of soybean diseases is determined by weather in a growing season, you may experience different soybean diseases from those in previous growing seasons. This article discusses the potential diseases that are likely to be found during your scouting this growing season.

Soybean diseases generally can be grouped as warm-season diseases and cool-season diseases because different pathogenic fungi have different temperature ranges for infecting plants. Typically, viral diseases, such as bean pod mottle virus, and some fungal diseases (Phytophthora rot, stem



Soybean field with iron deficiency.

canker, and frogeye leaf spot, a recent production problem), are warm-season diseases. Viral diseases are more prevalent in a hot and dry summers because the virus-spreading insects develop faster under such weather conditions.

If temperatures the rest of summer are cool with above-normal precipitation (as predicted), there may be more bacterial blight, brown spot, downy mildew, brown stem rot, and white mold. Bacterial blights normally occur in soybean fields in mid-July and beyond, and downy mildew shows up in late July and beyond. These diseases do not normally lower yield. Downy mildew, however, affects seed quality and usually becomes more severe if late-summer weather is moist and cool. Brown stem rot is more likely to occur in late summer.

Symptoms of iron chlorosis (such as yellowing) are more pronounced when temperatures are cool. This week, I observed more cases of iron chlorosis in central Iowa (see my June 23 *Integrated Crop Management* newsletter article, page 105). In plants with iron chlorosis, fungal root rots mainly caused by *Fusarium* species are

common, especially in soils having low temperatures and high moisture.

White mold has not been a widespread production problem in recent years due to warm and dry summers. An ISU study shows that white mold is prevalent when temperatures in July and August are below normal with above-normal precipitation. Besides temperature, several other factors are critical to the occurrence of this disease, including the use of narrow rows, early planting, and previous occurrence of the disease in particular fields. Absence of any of these conditions reduces disease risk significantly.

If white mold is a concern because of past occurrence in your soybean fields, you may want to look for white mold mushrooms during the second and third week of July if 1) you observed white mold-infected plants within the past 4 years in your fields; and 2) the soil in these particular fields is moist. Information on identification of white mold mushrooms can be found in previous *Integrated Crop Management* newsletters.

XB Yang is an associate professor of plant pathology with research and extension responsibilities in crop diseases.



Announcements

Register now for Crop Diagnostic Clinics

by Brent Pringnitz, Agribusiness Education Program, Department of Agronomy

Registration is now underway for the 2003 Crop Diagnostic Clinics at the Field Extension Education Laboratory (FEEL). These clinics provide an opportunity for clients to interact with ISU specialists and receive hands-on training in a variety of crop management areas. Topics included in this year's sessions are as follows:

- Corn management
- Soybean management
- Soil fertility
- Crop diseases
- Weed management
- Crop insect management
- Soil and water management
- Weed identification
- Forage management
- Soil compaction demonstrations
- No-tillage planter attachment demonstrations

Each clinic has been approved for the following certified crop adviser (CCA) continuing education units (CEUs):

- 1.0 nutrient management
- 2.0 soil and water management
- 4.5 pest management
- 4.0 crop management

Clinics will be held July 15–16, July 17–18, and July 22–23. Space is limited for each session and registrations are accepted on a first-come, first-serve basis. Registrations are NOT allowed at the door.

The complete brochure describing course offerings and registration materials is available from the Agribusiness Education Program Web site at <http://extension.agron.iastate.edu/aged>. For more information, you also may contact our office at (515) 432-9548.

The FEEL Crop Diagnostic Clinics are an excellent way to sharpen your crop production and protection skills and receive CCA credits. I hope you see at one of the clinics this month!



John Sawyer explaining current research in the soil fertility tent.

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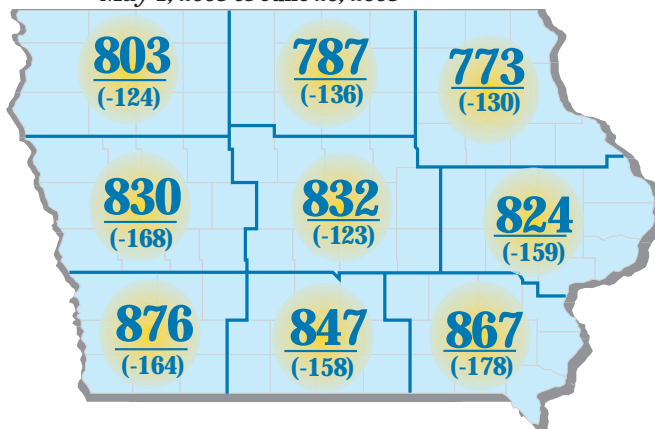
Crops growing rapidly as July begins

by Rich Pope, Department of Entomology

Crops across Iowa grew rapidly the last full week of June due to the favorable weather. Some areas of southwestern Iowa are a bit short on water, and grasshopper nymphs are present in considerable numbers. All-in-all, crops are mostly in good shape.

Rich Pope is an extension program specialist in entomology with responsibilities in integrated pest management and pesticide applicator training.

Accumulated base 50 F degree days
May 1, 2003 to June 29, 2003



accumulated degree days
(departure from average)

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... and justice for all

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