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Bean leaf beetles return--with a vengeance

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Abstract
We started detecting bean leaf beetles on April 19 this year as part of our annual bean leaf beetle monitoring program in central Iowa. As noted last week, bean leaf beetle mortality was predicted to be low, and based on last year's low numbers, we expected a slight increase in their numbers this year. However, we were surprised by the numbers we have found this past week!

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with low soil temperature early in the spring, potential soil diseases, and early germination problems just to name a few. Chopping residue also can reduce the effectiveness of it in protecting the soil surface from potential water erosion, especially during high intensity rainfall events, where residue will be washed away with the surface runoff. Chopped residue is no longer anchored into the soil and is more prone to plugging tillage implements or planters used in subsequent operations.

To have an effective and manageable residue cover at planting is to have corn residue cut as high as 12 to 24 inches. There are several reasons for that. (1) Cutting residue at that height minimizes the potential damage to equipment tires during planting and other field operations. (2) Standing residue will be much easier to manage during planting, where minimum loose residue on the soil surface can be managed with residue-removal attachments on the planter. (3) Upright residue can provide better protection to the soil surface from wind and water erosions by reducing wind and water flow near the surface. Given these reasons against chopping corn residue, no-till can be managed efficiently without affecting yield.

While cutting residue after harvest is one technique for managing crop residue, it is possible to avoid this step all together. This can be accomplished by calibrating the combine properly to ensure a uniform residue distribution on the soil surface. A few adjustments and fine tuning of a combine prior to harvest can pay off significantly in having uniform residue cover across the field.

The misconception about residue in no-till as an obstacle is widely used to avoid the adoption of no-till. The success of farmers who have been using no-till for many years shows that managing residue is possible and pays off economically and environmentally. Studies show that tilling corn residue prior to soybean planting did not improve soybean yield (see the April 3, 2006, *ICM* article, "Is tillage needed for your soybean crop?"). Removing residue for any purpose needs to be balanced with the potential impact that may take place—especially from water and soil quality perspectives. Although standing residue in the field is sometimes viewed negatively, it actually presents fewer problems for equipment or seedling establishment than chopped, detached residue.

The main idea is to look at no-till and residue management in a system approach by properly calibrating planting and harvesting equipment to achieve the intended results of no-till. Some producers approach no-till with the mindset to prove it does not work. Others approach no-till with the attitude that it can be done and they manage to achieve that. Despite the challenges faced with no-till, there are no shortcuts. No-till residue management should be executed in a system approach and given time to work, bearing in mind that it is a long-term commitment.

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Insects and Mites

Bean leaf beetles return—with a vengeance

by Jeffrey D. Bradshaw, Marlin E. Rice, and David Dorhout, Department of Entomology

We started detecting bean leaf beetles on April 19 this year as part of our annual bean leaf beetle monitoring program in central Iowa. As noted last week, bean leaf beetle mortality was predicted to be low, and based on last year's low numbers, we expected a slight increase in their numbers this year. However, we were surprised by the numbers we have found this past week!

We are finding about 340 bean leaf beetles per 50 sweeps in alfalfa. This average is only 84 beetles less than the early-season high (in alfalfa) from 2002 (our most abundant year to date). With these numbers, some growers may exceed the early-season economic threshold for bean leaf beetle injury (see tables). Palle Pedersen, extension soybean specialist, reported a 400-acre field near Grand Junction that averaged 3 beetles per seedling plant, so large populations can be found in Iowa this spring.

So what can farmers do now? Follow our current recommendations (see flowchart) for soybean management and choose the approach that best fits the end use of the soybeans (see graph).

Delayed planting

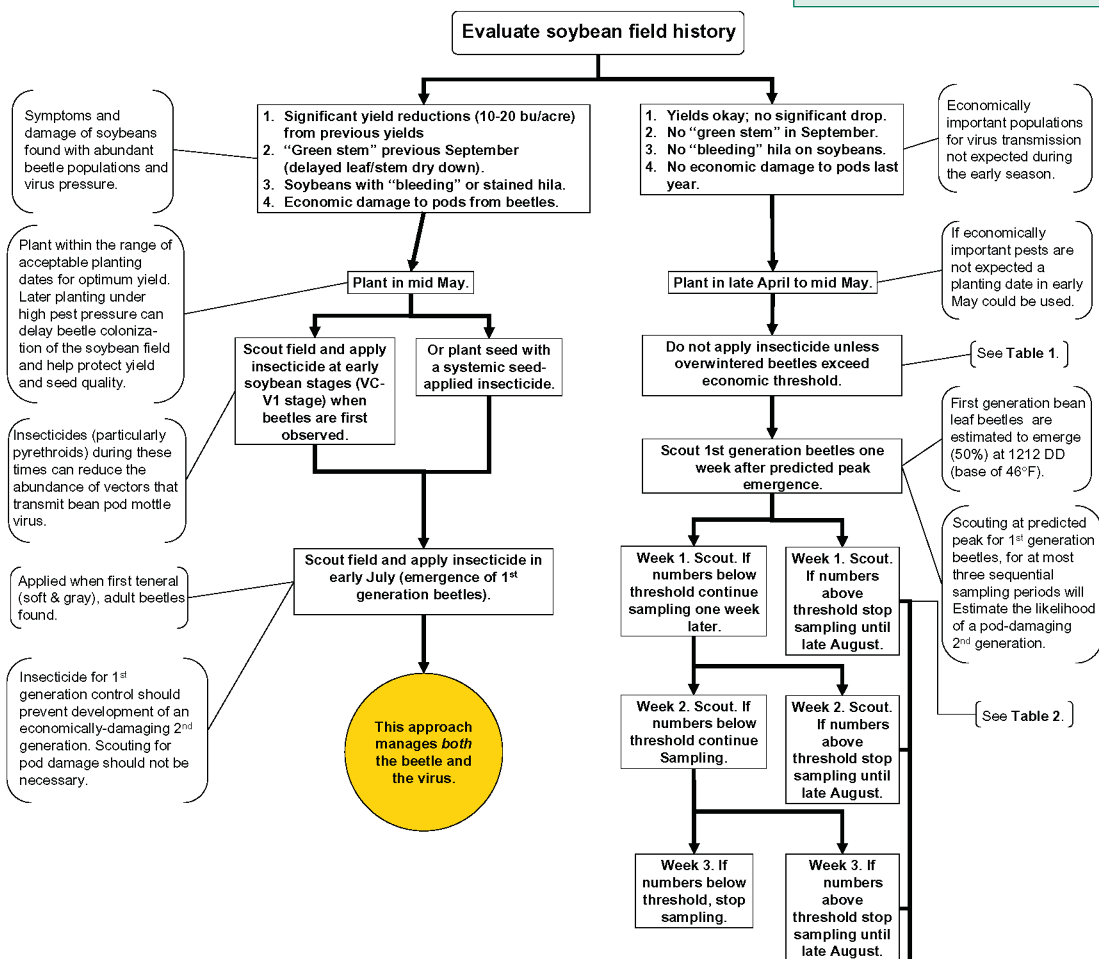
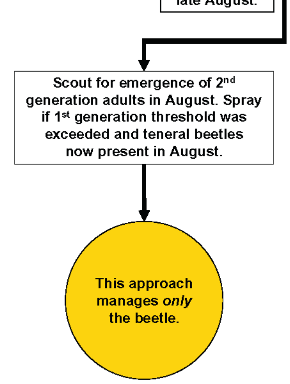
Planting from this date on could be considered as delayed, but planting in mid to late May still could yield near optimum yields without the beetle pressure. With high beetle pressure, late April and early May planting dates are at risk for sustaining large bean leaf beetle populations, pod damage, and poor seed quality.

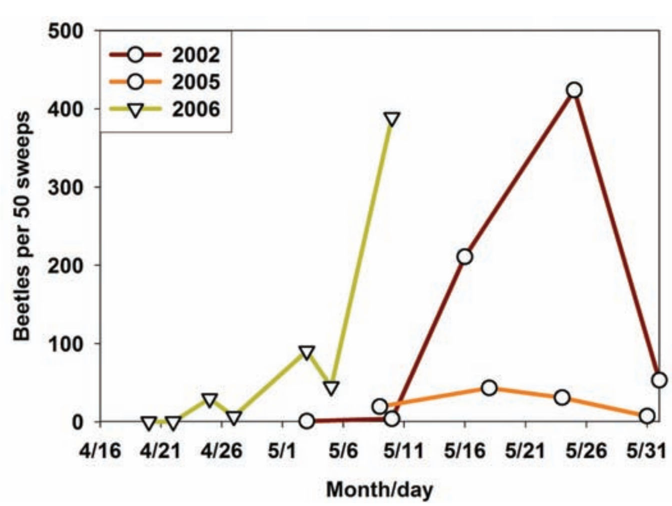
Table 1. Economic threshold of overwintered bean leaf beetles in early-stage soybean (beetles per plant). This chart does NOT consider the impact of bean pod mottle virus on soybean quality and yield.

Market Value ($/Bu)	Growth Stage/Cost of Treatment ($/Acre)								
	VC			V1			V2		
	6	8	10	6	8	10	6	8	10
5.00	2.4	3.2	4.0	3.7	5.0	6.2	5.9	7.8	9.8
6.00	2.0	2.7	3.4	3.1	4.1	5.2	4.9	6.5	8.1

Table 2. Economic threshold of 1st generation bean leaf beetles in soybean (beetles per 20 sweeps). This chart does NOT consider the impact of bean pod mottle virus on soybean quality and yield.

Market Value ($/Bu)	Cost of Treatment ($/Acre)				
	7	8	10	12	15
5.00	23.0	26.2	32.6	39.0	48.6
6.00	19.3	22.0	27.3	32.6	40.6
8.00	14.6	16.6	20.6	24.6	30.6
10.00	11.8	13.4	16.6	19.8	24.6
13.00	9.2	10.5	12.9	15.4	19.1



Consider an early-season insecticide

For managing bean pod mottle virus, which is the pathogen transmitted by bean leaf beetles, our studies indicate that an early-season, foliar insecticide is critical for suppressing virus incidence under high bean leaf beetle pressure. It is important to apply this insecticide as soon as beetles are present in your soybean field.

Consider a mid-season insecticide

Additionally, our studies indicate that although a mid-season insecticide by itself can not prevent an increase in bean pod mottle virus, it seems necessary to improve seed quality. Furthermore, if combined with an early-season insecticide, the two treatments give an added positive effect on yield and seed quality.

Scout 1st generation beetles

Finally, continue to scout your field 1 week following the predicted 1st generation emergence (1212 degree days, base 46 °F) to determine if your field is at risk for 2nd generation beetle damage. More information will be published in *Integrated Crop Management* later this summer regarding these management recommendations. If you are already following a virus-management plan, bean leaf beetles may not rebound in your field and a third insecticide may not be necessary; however, scouting would be good insurance.

We will continue to keep you informed regarding the progress of the bean leaf beetle population this summer.

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Plant Diseases

Fungicides: Terminology

by Daren Mueller, Department of Plant Pathology

First in a series

Many growers have never used foliar-applied fungicide for management of field crop diseases, especially on soybean. At this time, foliar-applied fungicides are the only effective option for managing Asian soybean rust. In the following weeks, there will be a series of articles to help producers understand fungicides and how they affect their production practices. Some of the commonly used terms are defined below:

Fungicide: a chemical or physical agent that kills or inhibits the growth of fungi. Fungicides have at least three names, all of which can be found on the label:

Chemical name: the name of the active ingredient (a.i.) in a fungicide (e.g., methyl (E)-2-{2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate).

Common name: a less technical term for the active ingredient (e.g., azoxystrobin).

Trade name: the patented name under which a product is commercially available (e.g., Quadris).

Active ingredient (a.i.): the active component of a fungicide. A single active ingredient may be marketed under several different trade names.

Fungicide resistance: the reduction in sensitivity to a fungicide by an individual fungus. Fungicides with single-site modes of action are at relatively high risk for resistance development compared to those with multi-site mode of action.

Classification of fungicides

Fungicides can be classified a number of different ways, including (1) mobility in the plant, (2) role in protection of plants, (3) breadth of activity, (4) mode of action, and (5) chemical group.

(1) Mobility in the plant

Contact fungicide: a fungicide that remains on the surface where it is applied but does not go deeper; these fungicides have no after-infection activity. Repeated applications are needed to protect new growth of the plant and to replace material that has been washed off by rain or irrigation, or degraded by environmental factors such as sunlight.