

Entomology: the study of insects



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Insects' impact on US agriculture

- Between 20% to 40% of global crop production is lost annually
- Each year, plant diseases cost the global economy around \$220 billion, and invasive insects around \$70 billion
- Weeds are another significant biotic constraint on global food production

Farmers scout looking for leaf or pod damage in beans



THRESHOLDS

<u>Growth stage</u>	<u>Description</u>	<u>Threshold</u>
V1 - R2	vegetative - bloom	30 %
R3 - R5	pod development - fill	10 %
R6	full seed	15 %

Approximate defoliation levels:

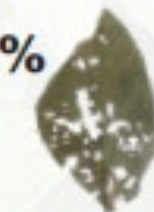
10%



15%



30%



Insecticide application may be required at any time throughout the development of the crop

- At planting time, seed treatments protect against seed maggots
- Treatment following emergence may control overwintering bean leaf beetles
- Up to bloom, soybeans can tolerate up to 40 percent defoliation without an economic loss in yield
- From bloom to pod-fill; more susceptible to defoliation should not be allowed to exceed 15 percent during that time.
- Once pods have set, treatment is needed when bean leaf beetle affects 10% or more of the pods

Beneficial insects

Conservation biological control

- Science-based pest management strategy
- Integrates beneficial insects back into cropping systems for natural pest control
- Reduces and in some cases eliminates the need for pesticides



Lacewing larvae: control soybean aphids

Honey bees can increase yield even in soybeans up to 18%

Resources for pollinators:
[offer.osu.edu/news/
new-resources-pollinators](https://offer.osu.edu/news/new-resources-pollinators)

