

Armyworms and Pasture Diversity: An Organic Approach

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June 14, 2012

Nature seems to clean its slate every now and then. From time to time, forest or grassland fires, floods, or pest outbreaks set succession back for a do-over. We know too well that cycles that occur in the natural world don't always align with our plans. Such might be the case in the mid-Atlantic as we experience disease outbreaks like blight or, as we are seeing now in New York, insect outbreaks like the dreaded armyworm.

But can we really call this armyworm outbreak a natural event? I think the jury is still out on this one. It could be, and there is a possibility that the severity of armyworm infestation on pastures may be complicated by our own actions. As I have reviewed the scientific literature, there seems to be no clear reason why armyworms reach inconceivable numbers and wreak such havoc on pasture systems. But there are some pretty good ideas, and a review of them might give us some insight on prevention and control.

Armyworms are naturally controlled by predators and disease, but cool, wet weather in the spring favors the armyworm at the expense of predators and parasitoids that naturally keep them in check. The very warm winter we experienced this year may also have impacted the very early moth flight that occurred several weeks ago, which is giving rise to extremely large populations of caterpillars in grass fields now. But why do they seem to get out of control? What are the mechanisms that skirt the natural predators and cause such damage?

Miguel Altieri, an entomologist with UC Berkeley, has identified several factors that promote or favor insect pests in agricultural systems:

1. Large, extensive monocultures and short rotations,
2. Close assembly of fields with similar species, and associated decrease in regional diversity, and
3. Increase in the density of host crop species.

The above factors may explain pest outbreaks in annual cropping systems, but what about the problem associated with pastures, which seem to be much more diverse and resilient than annual crops?

Pastures typically exhibit a greater diversity of plants, insect herbivores, parasitoids, and diseases. This could explain why we naturally assume pastures to be more resilient when it comes to pest problems. But still, we periodically experience events like this year's armyworm outbreak.

When we look at Altieri's list, what aspects may we associate with pastures? In some respects pastures have become less diverse due to grazing and haying practices. Both haying and management intensive grazing tend to move pasture systems toward more of a monoculture of grasses, due to the grass plant's ability to outcompete forbs when managed with intense, periodic, controlled defoliation. In addition, the lack of field borders, which has been associated in many studies with increased parasitoid populations, may contribute to reduced beneficial populations that naturally keep pests in check.

Building an insect-resilient pasture

According to Altieri, one of the best strategies to increase the effectiveness of pest predators is increasing the alternate host plant and pollen producing plant populations, including density and spacial distribution of populations. Developing an adequate non-target plant population can encourage insect predators to populate the environment much earlier than insect pests. What is clear is that the more diverse the ecosystem is, the more community linkages are developed which results in better insect stability. Thus, a pest population is less likely to become an outbreak.

Observations by the University of Vermont suggest that pasture diversity may help build pasture resiliency and some level of protection against complete destruction from armyworms. Given armyworms preferentially consume grasses, grass-alfalfa fields have a better chance of weathering an outbreak. Other plants that contribute to diversity include legumes such as clovers, trefoils and wild blooming forbs. Even if the caterpillars consume all the grass, some beneficial plants remain to provide soil cover, habitat, and some grazing. However, it was noted that in extreme infestations, even legumes such as alfalfa could become a target for armyworms.

Plant diversity therefore seems to be one of the best ways to insure pastures either resist or recover from an armyworm infestation. Border strips that include a variety of flowering plant types and species are known to be good incubators for beneficial insects. Allowing these strips to flower each season provides food and cover for insects that naturally prey upon armyworms and other pest insects. A combined approach of border strips and increased plant diversity in the field would go a long way toward building pasture resiliency and increasing the ability of the pasture to recover from an insect outbreak.

Prescriptive control

The second tier of insect pest management, after developing an ecological understanding and building a resilient pasture system, is prescriptive control. Sometimes its necessary to chemically control armyworms. These insects develop so fast and damage accrues so quickly that often some sort of chemical control is warranted. Organic farmers and graziers have a few approved materials that, if applied early, have the ability to reduce pest populations and allow pasture regrowth. OMRI, the Organic Materials Review Institute, has reviewed and approved the following materials according to the National Organic Program:

- Dipel DF
- Entrust Naturalyte

Organic farmers who choose to use one of these materials should update their organic system plan to reflect its use and follow label directions. As always, certified producers should check with their certifier before using any new material.

In summary, a resilient pasture ecosystem can be encouraged through providing alternative hosts for beneficial insects, providing pollen and nectar for predators and parasitoids, and providing overwintering sites for beneficial insect populations. As a last resort, the timely use of an organic approved insecticide can help pastures recover and hopefully allow for grazing and forage production later in the season.

April Fix 6/19/12 10:34 AM

Comment [1]: Would it be helpful to recommend a few other non-grass plants that could increase diversity in the pasture? I don't know much about pasture- but what about birds-foot trefoil, clovers. Maybe its obvious and doesn't need to be stated or is beyond the scope of this article...

