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## GRAPEVINE

By Maryann Whitman

### Ecological Pathways: Poisonous Slugs

How a series of interactions affect the Web of  
Life.

No-till farming (not plowing and harrowing and  
disking the land frequently), benefits field and  
forage crop production by reducing soil erosion,  
conserving water (if irrigation is necessary), improving soil health, and  
reducing fuel and labor costs. It's generally a 'good thing' to do.

Neonicotinoids are the most widely used insecticides, worldwide. They  
are systemic insecticides applied to seeds to prevent 'feeding' damage by  
early season insects. "Systemic" means that  
the insecticide enters into the actual cellular  
structure of the plant—including nectar and  
pollen. These insecticides are very successful  
against insects (and a number of other  
organisms, not to mention pollution of surface  
waters—but we won't go into all that at the  
moment).

Slugs thrive in the stable environment provided by no-till practices, and  
feed on duff and young green plants. Now, slugs are mollusks, not insects,  
so they are not susceptible to the insect specific poisons. But by chewing  
on the young plants, and ingesting the insects who have taken in the  
insecticides, slugs accumulate the toxins in their bodies—they become  
poisonous. Then, the insects that eat slugs, mostly predaceous beetles (who  
also eat other "pest insects" like aphids, but we won't go into that just  
now), are poisoned.

It's not yet clear what happens to frogs when they ingest the toxins  
accumulated in slugs, or birds when they eat the bugs. Hard to tell when  
they have tummy aches, or are feeling not so great. The research did show  
that, in the field, plots with neonicotinoid-treated seed had fewer insects and  
predators, more slugs, and lower yields than plots without the insecticides."

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Ref: John F. Tooker, Department of Entomology, Pennsylvania State  
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Garden Slug



Dead ground beetle