

# CROPEST ONTARIO

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**Corn Rootworm Adults Active**  
**Tracey Baute, Field Crop Entomologist,**  
**OMAFRA-Ridgetown**

Corn rootworm adults have been very active these last few weeks. You may have noticed some of the leaves in your corn field taking on a dull grey appearance. When you hold these leaves up to the light, you can see wide scratches or feeding tracks running parallel with the leaf veins (Figure 1). These are caused by the corn rootworm adult feeding. They typically prefer to feed on the silks and pollen but when not available, they can feed on the leaves. You may also see them feeding on soybean leaves which is a normal part of their diet as well and is not an indication that the rotation variant is in those fields.

Though the leaf feeding injury in corn may look bad in areas, it is not economical. The bigger concern is when these very active adults move onto the corn silks. Spraying for adults is extremely rare in Ontario though this year may have some exceptions. Scout these fields for the next few weeks.



Inspect ears and silks randomly across the field. If the silks are clipped to less than ½ inch on the majority of the ears control may be necessary. It is especially important in a dry season when the plant may not be able to grow the silks back as quickly, which can impact proper pollination. Bt rootworm hybrids only protect the roots from larval feeding and have no activity on the adults feeding on the silks.

Now that the adults have emerged, it is also a good time to assess the root injury from the larvae in continuous corn fields and also determine if control will be necessary next year if those fields are going into corn again. For root

feeding, bring a shovel and dig around a few plants, ensuring that you take a large enough root ball that you are not clipping or cutting off parts of the root system with your shovel. Shake off excess soil and soak these roots in water overnight to

wash off all of the soil from the roots. Look for signs of clipping and tunneling in the roots. Determine if the product you used this year gave you adequate control. In heavy rootworm years, you may find that the high rate of Poncho (1250) did not give adequate protection to the roots. If this has happened, you may need to consider switching to a rootworm Bt hybrid next year which has

been shown to give better control under heavy rootworm pressure. Don't be surprised though if you also see some root feeding even on the Bt rootworm hybrids as these hybrids only produce a low to moderate dose of Bt.

If you are considering going with continuous corn next year, look for adult activity in your field now. Scout 10-20 plants in 5 areas of your field. 1 adult per plant in the next two weeks indicates that egg laying activity was high enough in your field to warrant treatment at planting if corn is planted again in that field next year.



Figure 1. Adult rootworm feeding injury on corn leaves (Photo credit: Marlin Rice, Iowa State University)

## Soybean Aphids or Bean Leaf Beetles – Which is Your Pest?

Tracey Baute, Field Crop Entomologist, OMAFRA-Ridgetown

Depending on your location, soybean aphids may barely be present in your fields. Other locations, particularly those in Perth, Wellington and Dufferin Counties, have been dealing with them for over a month now, with some fields requiring more than one application of insecticide. We really only have 2- 3 weeks left for the aphids to start doing something to reach thresholds before the crop is in the later R5, early R6 stages. So cross your fingers and hope that the natural enemies keep up and let's hope that a mass immigration of winged adults does not take place before then.

We have also been fortunate that spider mites have not been as big of a problem, given how dry it has been in many locations. Why they haven't been is still a bit of a guess. But there is still some risk of them causing problems in some fields so continue to monitor for signs of activity until the soybeans are in the R6 stage.

But the next concern is bean leaf beetle. The first generation started up a few weeks ago and with the lack of rain, some fields have not been putting out new leaves quickly to compensate for defoliation. A small number of fields had to be sprayed in the last week as they did reach the 15% defoliation threshold during the R1-R4 stage. The

concern is that there is still one more generation of adults to come. This second generation typically starts up in August and starts to feed on the pods. Given the higher number of first generation adults present and their further geographical range this year, more fields are at risk before the season is finished. For IP, food grade and seed fields, if 10% of the pods on the plants have feeding injury **AND** the beetles are still active in the field, a spray is warranted. Keep in mind however, the closer you get to harvest you need to consider days to harvest intervals.

Some are asking... "If I spray for bean leaf beetles, does it kill off the natural enemies that are keeping the aphid populations down so it causes them to become a problem too?" This is a risk, but the closer we get to the R6 stage, the less likely the aphids will be able to build up to threshold levels. Also, the fewer aphids you have at the time of the spray, the less there are to rebound. In fields with very low aphid populations, the natural enemies have done their job already, and most likely have moved on to find more aphids to feed on in more populated fields. Best recommendation is to deal with the pest at the time, following the thresholds and watch closely to make sure another pest does not take its place before the season is done.

## Take Time to Scout for Tarnished Plant Bug in Canola and Beans

Tracey Baute, Field Crop Entomologist, OMAFRA-Ridgetown

I sometimes wonder if you even want to read one more article from me, as it usually means there is another insect pest to watch out for. Let's face it, 2007 has been a busy year for insects. But one more pest should not be missed just because we are all getting a little tired of scouting the crops. Hot, dry weather is ideal for the seed stinging insect, tarnished plant bug.

Tarnished plant bug adults are approx 5 mm in length, are yellowish to reddish brown in colour and have a small triangle shape on its back (Fig. 1). The nymph stage doesn't look the same as the adult but is a yellowish-green, wingless and lacks the distinctive triangle shape on its back (Fig. 2). They have several different host crops but tend to move into canola and edible beans when alfalfa is being cut.



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**Figure 1. Tarnished Plant Bug Adult (Flax Council of Canada)**

have piercing-sucking mouthparts that they use to pierce into the plant tissue and inject saliva that breaks down some of the plant tissue. If injury takes place during the pod stages, scarring, malformation and dimpling or pitting on pods can occur. They can also drill directly into the seed.

To scout for them, take 20 sweeps (180 degree arc = 1 sweep) in 5 areas of the canola field. Border rows are apt to have higher populations so ensure that you sweep further into the field to get a good idea of the average number of TPB per sweep. No thresholds have been validated for Ontario, though other jurisdictions recommend spraying in canola when 2 bugs per sweep can be found after petal fall but prior to pod maturity. For edible beans, control is necessary if 1-2 bugs/sweep can be found up to later pod fill stage.



**Figure 2. Tarnished Plant bug Nymph (Bauer, USDA ARS)**

## Moisture Stress in Soybeans

Horst Bohner, Soybean Specialist,  
OMAFRA, Stratford

Prolonged dry conditions can reduce soybean yield at any stage of development, but there are two stages that are the most susceptible. Sufficient water during germination and during the reproductive growth stages is critical. Dry soil conditions during germination will reduce plant stands and can lead to thin, patchy, and uneven stands. Moisture stress during the reproductive stages will lead to fewer, smaller, and poor quality seeds. Severe moisture stress is evident by leaf wilting and under extreme conditions may lead to plant death.

A lack of moisture during the vegetative growth stages (May and June) is usually not yield reducing if enough moisture was present for emergence. Under these conditions plants grow deep, vigorous root systems searching for water. These extended roots provide excellent nutrient uptake when rainfall occurs later in the season.

The crop is the most susceptible during the reproductive stages of growth. Soybeans will begin to flower during the last week of June. Once the plant starts to flower it needs significant water right through to seed fill.

Soybean yield is a function of the number of plants/acre, pods/plant, seeds/pod, and the size of the seed. Each of these yield components is fixed in the above order during specific timeframes of plant development. Moisture stress confined to a specific growth stage reduces the yield component that is established during that phase. On the other hand water abundance during a specific phase enhances a specific

component. Stress early during the reproductive stages reduces seed number. However, if moisture returns that reduction is offset by enhanced individual seed size or mass. Stress later during the reproductive phases greatly depresses seed mass, the last yield component to be fixed during reproduction. See table #1

**Table #1. Yield, Number, and Individual Mass Response to Moisture Stress.**

Water Stress Timing	Yield (g pot <sup>-1</sup> )	Seed Number (no. pot <sup>-1</sup> )	Individual Seed Mass (mg seed <sup>-1</sup> )
Control	29.3 a	240 a	120 b
R1-R5	24.1 b	129 c	190 a
R5-R7	16.9 c	196 b	90 c

Means followed by different letters are significantly different, LSD (P = 0.05).  
Reaper and Purcell, 1999.

Varieties grown in Ontario have an indeterminate growth habit. This means they have an overlapping vegetative and reproductive growth period. This results in an extended flowering period lasting from the end of June into early August. This developmental trait protects yield potential during periods of stress. Yield that may be lost due to flower abortion early in the reproductive stages can be compensated for by flowers and pods that will be produced later in the season. In other words a good rain at the end of July may provide just as much seed set as having a few small showers during early flowering.

If plants go through the entire flowering period with insufficient moisture significant yield losses will occur. Even if water is supplied past flowering yield losses cannot be regained.

### Stress Induced Nutrient Deficiencies

Inadequate water reduces nutrient availability, nutrient uptake and movement within the plant. One of the most evident water stressed nutrient deficiencies is potassium (K). K deficiency leaf symptoms

often become evident in dry soils even if soil K levels are adequate. In dry conditions the roots are unable to take up K from the soil.

Another serious consequence of moisture stress is the reduction of biological nitrogen fixation. The high protein concentration of soybean grain requires a large amount of N. A 50bu/ac crop of soybeans will remove 210 lbs of N per acre. Plants that lack water will shut down N fixation in the root nodules. One of the reasons soybean yields are lower in dryer years is because the plant has inadequate nitrogen.

### **Increased Susceptibility to Disease and Insects**

Plants weakened by stress are also more susceptible to disease and insects. In dry years soybean cyst nematode (SCN) above ground symptoms become more evident. Plants are short, stunted, and yellow. The yield impact of SCN is worse in dry years because plants are unable to compensate as much as they could when moisture is prevalent. Also, insect feeders like soybean aphids do considerably more harm in a dry year than in a wet year. Aphids suck juices from the plant causing stunting and reduced seed yield if populations are high.

Aphids prefer plants that show K deficiency and will cause yield reductions if left uncontrolled on these plants. See figure #1.

### **Strategies for Success**

There are no management strategies to alleviate moisture stress once it occurs. Irrigation is impractical for most producers. The following practices have been shown to lighten the impact of moisture stress:

- 1) Planting deep enough for adequate germination moisture
- 2) Early planting for greater root depth and density
- 3) Establishing a full canopy early in the season through narrow rows
- 4) Good weed control to reduce competition
- 5) Good crop rotation
- 6) Careful management of disease and insects
- 7) A good fertility program



**Figure #1.** Plants showing K deficiency due to moisture stress. High aphid populations are also present on these plants.