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CROPEST ONTARIO

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**Plan to attend the 13th Annual
Southwest Crop Diagnostic Day
July 11 or 12th, 2007
Ridgetown Campus, University of
Guelph**

Come out and experience this unique hands-on field day. Planned topics for this year will include a look at Ontario’s worst weeds, early season soybean diseases, grass weed identification, soybean aphids



(scouting, seed treatments, natural enemies and optimum application of insecticides), pheromone trapping, herbicide injury in corn and

soybeans, reading your roots, soybean physiology and production management, cover crops after wheat, nutrient deficiencies and more.

For more information visit the website at www.diagnosticdays.ca or call the Ridgetown OMAFRA Resource Centre 519-674-1698.

Register today!

Impact – A new Corn Herbicide for Ontario

**Mike Cowbrough – OMAFRA
Allan Kaastra, Dr. Peter Sikkema
and Dr. Clarence Swanton -
University of Guelph**

A new active ingredient for weed control in corn enters the Ontario marketplace in 2007. Distributed by BASF, Impact (topramezone) is a non-residual contact herbicide that provides broadleaf weed control and activity on a number of grassy weeds. Growers will be encouraged to tank-mix Impact with Frontier + atrazine for contact and residual control of grass and broadleaf weeds from the 1 to 3 leaf stage of corn.

RECOMMENDED TANK-MIX RATES:

- 1) **Impact:** 15 ml/ac (yes, the rate is that low!) +
- 2) **Frontier:** 0.45 L/ac +
- 3) **Aatrex 480:** 0.42L/ac +
- 4) **Assist:** 12.5 L/1,000 L water +
- 5) **28% UAN:** 12.5 L/1,000 L water

MODE OF ACTION: Impact is an “HPPD” inhibitor similar to Callisto and Converge.

WHEN TO APPLY: Impact will only control emerged broadleaf weeds at the 1-8 leaf stage and suppress emerged grassy weeds at the 1-4 leaf stage. Impact alone can be applied up to the 7 leaf stage of corn, but when tank-mixed with Frontier + atrazine can only be applied up to the 3 leaf stage of corn.

STRENGTHS: The tank-mix of Impact + Frontier + atrazine will control emerged annual grasses more effectively

than Callisto + Primextra II Magnum when applied postemergence to corn.

WEAKNESSES/LIMITATIONS:

- Impact alone or in a tank-mix with Frontier + atrazine does not control velvetleaf.
- Impact does not control perennial weeds.
- Broadleaf weed control will be significantly reduced when the tank-mix of Impact + Frontier + atrazine is applied prior to broadleaf weed emergence.
- Fall panicum control will be reduced if the tank-mix of Impact + Frontier + atrazine is applied prior to its emergence.



Figure 1 - Weed Control achieved in a field scale trial with Impact + Frontier + atrazine + Assist + 28% UAN in 2006. A 3 X 10 m untreated check (see bottom left hand side of the image) was left in the field to evaluate the level of control.

ANNUAL WEED CONTROL: In public research trials the tank-mix of Impact + Frontier + atrazine effectively controlled the following common broadleaf and grass weeds.

- Common lamb's-quarters
- Lady's thumb
- Pigweed species
- Wild buckwheat
- Common ragweed
- Barnyard grass
- Yellow foxtail
- Green foxtail
- Witch grass
- Large crabgrass

PERENNIAL WEEDS: Impact does not offer control of established perennial weeds.

CONTROL OF "ODD BALL"

WEEDS: A number of Federal Research Permits were conducted by the University of Guelph in 2006 whereby field scale weed control of Impact + Frontier + atrazine was evaluated. The following weeds were documented as being sensitive to this tank-mix, however more trial work is need to substantiate these preliminary results.

- Shepherd's Purse
- Annual sow-thistle
- Broadleaf plantain
- Narrow leafed hawk-s-beard
- Wood sorrel
- Black medick
- Creeping speedwell
- Night flowering catchfly
- Seedling dandelion

COST: At the time of press, pricing on this tank-mix was not available, although in typical fashion we were told that this

tank-mix would be priced "competitively".

SUMMARY: Impact is a new offering for emerged broadleaf weed control in corn but also has a surprising amount of activity on small emerged annual grassy weeds in the 1-4 leaf stage. The tank-mix of Impact with Frontier + atrazine provides broad spectrum contact and residual weed control. To achieve effective broadleaf weed control this tank-mix must be applied after broadleaf weeds have emerged. Control of Fall panicum is improved when applications are made to emerged Fall panicum at the 1-4 leaf stage. This tank-mix should not be used when velvetleaf and perennials are the target weed species.

Cereal Aphids Found in Wheat - "Should You Be Concerned?"

Tracey Baute, Field Crop Entomologist, OMAFRA-Ridgetown

Some diligent crop scouts have reported finding cereal aphids in the wheat crop this week. Though rarely do aphids reach economics in wheat in Ontario, we do need to keep an eye on them to make sure they don't try to beat the odds.

There are several species of aphids that are grouped together as "cereal aphids". The most common are bird cherry oat aphids (**Figure 1**) and corn leaf aphids (**Figure 2**), though English grain aphid and greenbugs can sometimes be found. The aphids would have been present since the fall, and usually are more prevalent in early planted fields, as those

plants would have emerged when the adults were flying around looking to find a nice home for their offspring for the winter. The aphids usually hang out at the base of the plant, either within the whorl or even underground at the base if night temperatures are quite cool. Once



Figure 1. Bird Cherry Oat Aphids. Note the red patches around the tailpipes of the aphid.
Photo Credit: J. Obermeyer, Purdue University

temperatures increase and the crop grows taller, they can be found on the stem and leaves of the plant. Some predators do take action and help keep aphids populations below threshold. When scouting you may see the odd ladybug which does tell you that there is something there for them to feed on.



Figure 2. Corn Leaf Aphids.
Photo Credit: University of Illinois Extension

On-farm trials done in Ontario have not found an economic benefit to spraying aphids, though if populations reach an average of 12-15 aphids per plant prior to heading, an insecticide application may be required, though again, this is a rare event in Ontario. Make sure to scout throughout the field when determining the average, since aphids can start in patches and population levels can be overestimated if scouting is only done in these patches. After heading, the threshold is 50 aphids per plant. Both Malathion 500 and Lorsban 4E are registered for aphids in cereals. Consult product labels for rates and precautions.

The main concern with cereal aphids is that they vector barley yellow dwarf, especially if volunteer wheat was present in the field in the fall when the aphids arrived. They can pick up the virus from unhealthy plants and vector it into the healthy crop. Applying an insecticide will not reduce the incidence of barely

yellow
dwarf.

For more information, refer to the Agronomy Guide for Field Crops, OMAFRA Publication 811 at:
<http://www.omafra.gov.on.ca/english/crops/pub811/p811toc6.htm>

Critters in the Soil Taking Out the Crops

Tracey Baute, Field Crop Entomologist, OMAFRA-Ridgetown

Now that the crops are growing and people are out scouting some injury reports are coming in.

Grubs in Wheat- Quite a few calls have come in this week about wheat that was once looking good (or at least made it through the winter) is starting to go backwards, especially on the sandy knolls. In most cases, once you do a little digging in those knolls you find that the culprits are grubs, either European chafer or June beetles, depending on the field. If damage is significant and replant into corn is necessary, an insecticide seed treatment (Poncho or Cruiser) will be required. Determining which rate to use can be tricky. Dig in the areas of concern. If grubs are easily found, with an average of 4 or more grubs per square foot, the high rate may be necessary.

Plant into good soil conditions so that the corn can grow ahead of any feeding injury. And don't expect 100% control



Figure 1. Corn seedling damage from millipedes. More than 6 millipedes were found around this one seedling. Photo credit: Tom Tyhurst, Pioneer Hi-Bred.

when using seed treatments. Remember that the grubs need to feed on the seed or seedling before getting a toxic dose of insecticide. If 2 or 3 grubs take a bite from the same plant, the plant may not recover.

Millipedes in Corn – Injury from this new pest has started to show up again this year. Tom Tyhurst, of Pioneer Hi-Bred was scouting a field this week and found corn seedlings being fed on by a cluster of millipedes (Figure 1). Usually found in higher residue soils with lots of organic matter, millipedes used to just be a good guy, helping break down residue. In the past few years, it appears that once the corn seed starts swelling and sprouting the millipedes are interested in feeding on it. Injury can also occur in carrot and sweet potato fields. A project is underway with OMAFRA and the University of Guelph to try to figure out

why this has become a pest. Unfortunately, there are no products available that work on this non-insect pest. The best recommendation we can make for now, is to not plant too early, planting in good soil conditions so that the crop can grow quickly ahead of any feeding injury. Please contact me if you find any fields with millipede injury so that we can take some samples for our project. For more information on millipedes, refer to the

millipede article written last year in *CropPest Ontario*, Volume 11, Issue 3, May 6, 2006.

Winter Wheat Update as of May 8/07

Jen Mullen, Assistant to Peter Johnson, OMAFRA Cereal Specialist, Stratford

Winter wheat has reached its rapid growth stage, with each day adding inches. Fields in Essex/Lambton are moving past Zadok's stage 32, with advanced fields almost at flag leaf emergence (Zadok's 37). Fields in Huron/Bruce are at stage 31. Late planted fields are finally showing growth, at Zadok's 30. Bare patches in Essex/Lambton fields are becoming heavily populated with annual weeds.

Annual seedlings in Bruce/Huron have not yet reached populations seen to the south, but are emerging rapidly, with many weeds at the "white" stage. Bird cherry oat aphids can be found in most fields. Aphids are rarely a direct threat to yield, but can transmit barley yellow dwarf virus. Thresholds are 15 aphids/plant before heading and 50 aphids/plant after heading. Septoria is present at low levels in most fields. There are isolated cases of powdery mildew and septoria moving into the middle 1/3 of the plant. Physiological fleck is common in most fields. Disease pressure remains well below threshold levels.

Table 1. Weed Stages and Species as observed in Essex, and Huron/Bruce

Species	Stage			
	Essex		Huron/Bruce	
	May 3	May 8	May 3	May 8
Chickweed	Mid-full flower	Full flower	4-6" trails	Mid-full flower
Annual grasses		1-leaf		spike
Shepherd's purse	Mid-full flower	Seed – set	90% Rosette – bolting, 10% flowering	Full flower
Lambsquarters/ spreading atriplex	4-6 leaf	6+	Cotyledon-2 leaf	Cotyledon-2 leaf
Pigweed		Cotyledon-1leaf		White root
Ragweed	80% 2 leaf, 20% cotyledon	10% cotyledon 70% 2 leaf, 20% 4 leaf	90% cotyledon 10% 2 leaf	90% cotyledon 10% 2 leaf
Lady's thumb				2-3 leaf
Milkweed		6-8" tall		
Dandelion	20% flowering	90% flowering,	heads emerging	flowering
Annual sow thistle				3-5 leaf rosette
Field violet				Flowering
Velvet leaf		Cotyledon		
Horsetail	4-6" tall (veg)			
Tufted Vetch				3-4" trails

Wheat Viruses – What to Look for!

Albert Tenuta – Field Crop Plant Pathologist, OMAFRA, Ridgetown

Although the general wheat disease pressure is low throughout most fields things could change rather quickly and therefore, keep scouting those wheat fields. One group of diseases that are often overlooked and have been increasing are the viruses. They are a fascinating group of pathogens and although they are really small they can take a significant punch out of yields. For example, Arend Smid (Emeritus University of Guelph Ridgetown Campus) observed in 2006, a 20 to 35% yield loss for seven varieties infected with viruses in his Ridgetown plots (Figure 1). Tolerant varieties in these same plots (Figure 2) had either little visual disease symptoms and/or recovered from the infection sufficiently resulting in minimal yield loss (<5%).

Viruses hijack the plants own metabolic machinery and turn the plant's engine into a virus-producing machine. There are 500 to 600 plant pathogenic viruses that can cause considerable plant damage in many crops. Once new virus particles are produced they need to find a way to other plants. Spread or transmission of can occur through various means. These include a direct transfer from an infected plant to a non-infected plant through direct plant-plant contact (such as roots), mechanical injury, seed infection, and various vectors. These vectors include a) Insects such as leafhoppers, aphids, thrips and mites, b) Fungi and c) Nematodes.

Three of the most common wheat virus diseases in Ontario are *Soilborne Wheat Mosaic Virus (SBWMV)*, *Wheat Spindle Streak Mosaic Virus (WSSMV)* and *Barley Yellow Dwarf (BYD)*. Table 1 compares the three viruses.

The symptoms, life cycle and field pattern of **wheat soilborne mosaic virus (SBWMV)** and **wheat spindle streak mosaic virus (WSSMV)** are very similar. It is not uncommon to find that many plants are infected with both viruses since they share a common vector. The common link is a soilborne fungus called *Polymyxa graminis*.

The fungus produces zoospores (swimming spores) which invade root hairs and epidermal cells of young plants during periods of high soil moisture or in low, wet areas of the field. The fungus can remain in the soil for at least 8 years. Temperature also plays an important role in these diseases. As the temperature increases the visual symptoms and damage decreases allowing the plants time to recover. Yield losses often range from less than 5% to 10% for wheat spindle streak mosaic to 10-40% for soilborne mosaic virus.

The primary symptoms of *Barley Yellow Dwarf Virus* are stunted plants that have yellowing, reddening or purpling leaf tips. BYD is often confused with spindle streak mosaic virus, soilborne mosaic virus, nutrient deficiency or environmental causes. Unlike SSMV and SBMV, Barley Yellow Dwarf is transmitted by aphids. Several species of aphids have been identified as vectors for BYD, these include the greenbug, the corn leaf aphid, the English grain aphid and the oat birdcherry aphid.



Figure 1. Wheat Plots Infected by Virus (Arend Smid, University of Guelph)

BYD is usually found in patches 1 to 2 metres in diameter but can occur uniformly throughout the field if aphid populations are also uniform throughout the field. Yield losses are very dependent on when the crop was infected. Generally, losses are greater when infection occurs in the fall rather than the spring.

Identifying viral pathogens is very difficult and require accurate serological tests. Best to send samples to a diagnostic lab such as the University of Guelph's Pest Diagnostic Clinic in Guelph which have such capabilities. Some of the serological tests that are available at the Pest Diagnostic Clinic



Figure 2. Wheat Virus Damage (Arend Smid, University of Guelph)

include Barley Yellow Dwarf Virus (BYDV), Soil-Borne Wheat Mosaic Virus (SBWMV), Wheat Spindle Streak Mosaic Virus (WSSMV), Wheat Streak Mosaic Virus (WSMV) and many others. They can test for one virus or screen for a group of viruses. Sample turnaround time varies between 24 hrs and two weeks depending on the viruses you wish to test for. The cost varies with the number of viruses tested and the number of samples submitted. For more information, call the Pest Diagnostic Clinic at (519) 767-6256 to receive a sample submission form and fee schedule

Table 1. Comparison of BYD, SBWMV and SSWMV

Virus	Transmission	Major Symptoms	Additional Hosts Besides Wheat
Barley Yellow Dwarf	Aphids	General chlorosis, reddening, purpling, stunting	Barley, oats, corn, sorghum, millet, grasses
Soilborne Wheat Mosaic	Soilborne fungus (<i>Polymyxa graminis</i>)	Yellow-green mosaic, stunting, rosetting	Rye, barley, grasses, sorghum
Wheat Spindle Streak Mosaic	Soilborne fungus (<i>Polymyxa graminis</i>)	Green-yellow mosaic, streaks, spindles	Rye, barley