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Ontario's Worst Sprayer Operator

Helmut Spieser, Agricultural Engineer, OMAFRA, Ridgetown

The spring of 2010 has been frustrating to say the least. Depending on your location in Ontario, many different factors have proved to be a hindrance to getting the spray job done. These factors included; fields too dry or too wet, the date on the calendar, rainfall, fields too wet, wind, weeds bigger than the crop, weeds too big to spray, planting then trying to do a burndown and many more. From my standpoint, the continuing incidence of off-target spray drift is really upsetting. There have been numerous articles written talking about things sprayer operators should do to manage and hopefully avoid drift. When drift events occur, it is obvious that the message is not getting through. This calls for a drastic change in tactics. New for 2010, we are looking for Ontario's Worst Sprayer Operator.

Ontario's Worst Sprayer Operator ...continued

Things we Know

- spray drift is avoidable but you may not like all the options
- wind can carry off very small spray droplets
- all nozzles produce some driftable fines
- air induction nozzles significantly reduce spray drift
- air induction nozzles are not drift proof
- windmeters give accurate wind speeds in the field at time of spraying
- you have to use a windmeter to know the actual wind speed
- product labels are getting better at providing information on acceptable spray conditions
- spray condition forecasting programs provide information up to three days out on suitable conditions factoring in droplet size and boom height
- everyone who sprays or supervises that person is trained
- blind people don't operate sprayers
- jockeys ride horses and shouldn't drive sprayers
- you can't measure wind speed from inside the cab
- spray drift is an offence and you could be charged and/or fined under the Environmental Protection Act
- off-target drift can be costly

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Every year more and more information on spraying comes out. This may be information on new chemistry with new modes of action or targeted to crop pests and diseases. It may be information on new nozzles. It may be information on nozzle configuration to get the spray droplets to the area of the crop to control a certain pest. Sprayer operators are exposed to this information but sometimes forget the basics of spraying. The science of droplet behavior in the environment doesn't change just because of a new or improved product. You are still using nozzles to produce droplets and using a sprayer to distribute these droplets uniformly across acres of crop land. Sprayer operators should be getting smarter but sometimes you wonder. With the internet, everyone is getting smarter. Even the bystander who is next door to the spraying operation knows what spray drift is and what should be done to minimize or eliminate spray drift. Ask the neighbour what the wind speed was when you we spraying next door. Chances are they may just be able to do that.

How to Stay out of the Headlines

You really don't want to win the title of Ontario's Worst Sprayer Operator. If you are judged to be Ontario's Worst Sprayer Operator it means you are a hazard to everyone with crop growing around the fields you are spraying. You obviously don't do everything you could to minimize the risk of spray drift. You have to face the facts that there will be times when you just can't spray. You will be famous for all the wrong reasons. The

Ontario's Worst Sprayer Operator
...continued

candidates for this contest aren't just involved in agriculture. Contractors who spray roadsides are also prime candidates for the Worst Sprayer Operator title.

Whenever off-target spray drift occurs there are many excuses given as to why it occurred. Unfortunately, there are no reasons that off-target drift should occur. Sprayer operators have numerous options available to control drift onto adjacent crops. Make sure you choose the best option to prevent spray drift to avoid charges, monetary penalties and bad neighbour relations that usually result.

Roundup Ready crops have provided farmers a weed control strategy that allows spraying well into the growing season. Unfortunately, most other crops are also up and growing at this time. As we get later into the season, sprayer operators need to adjust their sprayer for maximum drift reduction. As the crops and weeds get taller, operators have to increase their boom height. The drift potential increases as one increases boom height. Wind speeds tend to increase the higher the boom is above the canopy.

Ontario Worst Sprayer Nomination Form

I wish to nominate:

Name: _____

Address: _____

Phone Number_____

for the Ontario Worst Sprayer Award !

I have observed the above listed producer's operation and consider them to be dangerous!

- **Directions to nominee's farm**
  _____
- **Name and address of individual or firm making nomination**
  _____

Please send nomination form(s) to :

CropPest Ontario
P.O. Box 400
Ridgetown ON N0P 2C0

Figure 1. What are the odds of a field being hit from both the east and the west?

Spray Drift Cases Already this Year

- Spray Drift X 2 – Not bad enough to be drifted on from the west, two weeks later the same field is again assaulted by spray drift from the east
- Whole orchard touched by drift from an adjacent field
- Whole garden wiped out from field spraying activity
- Roadside spraying drifting onto vegetable field

Identifying Common Corn leaf Diseases

Albert Tenuta, Field Crop Plant Pathologist, OMAFRA, Ridgetown
David Hooker, Agronomist, University of Guelph – Ridgetown Campus

As the corn crop approaches tasseling, we have had many ask how to distinguish between the common corn leaf diseases. Remember identification is critical to properly determining the risk these diseases have to the crop and ultimately yield. For instance, diseases such as eyespot can look bad but overall the yield loss potential is far less then northern leaf blight, common rust and gray leaf spot. The following images and descriptions will help you identify these diseases.

Figure 1. Anthracnose Leaf Blight on Corn

Anthracnose: The main symptoms are leaf spotting, top die-back and stalk rot and anthracnose can affect both the leaves and stalks. Leaf spots are oval (up to 15 mm long) with a tan centre and reddish-brown border. Individual lesions may join forming streaking along the margin or mid-rib. A general yellowing of the tissue surrounding the infected areas often develops. With the aid of a handlens, small black spots can be seen in the centre of the lesions. Under close examination, black hairs (setae) may be seen protruding from these spots. The disease is first observed on the lower leaves especially early in the season and later on the upper leaves. Top die-back can occur late in the season as diseased leaves wilt and gradually die above the ear which resembles frost damage.

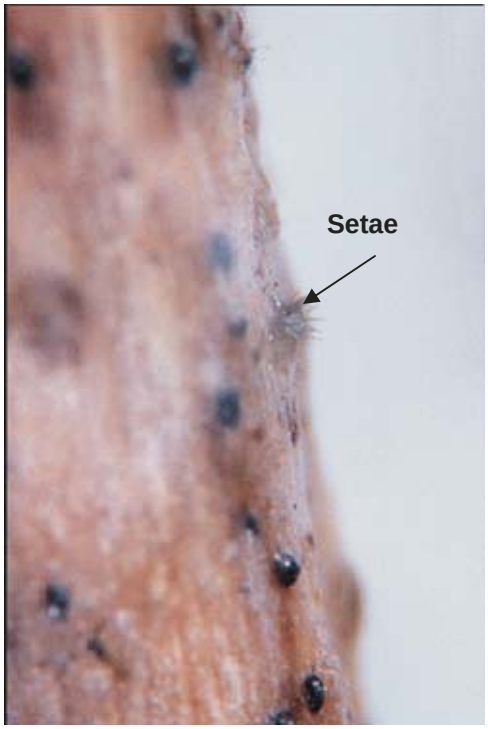


Figure 2. close-up of setae (hairs) of Anthracnose Leaf Blight

Residue is an important component in anthracnose development since the fungus survives (overwinters) as mycelium or sclerotia within corn residue or seed. Rain splashes spores from the corn residues onto the lower leaves and stalk. For this reason, corn fields that follow corn (second year corn) are the most prone to anthracnose infection especially when the weather is warm and wet.

There are differences between seed corn inbreds and field corn hybrids in there susceptiblity to anthracnose leaf blight. Do not confuse resistance to anthracnose stalk rot since this is separate from anthracnose leaf blight. Hybrid resistance to anthracnose stalk rot does not guarantee resistance to anthracnose infections on leaves. In conventional corn fields, removal of corn residues through tillage will lower your risk to the disease especially when corn follows corn. In no-till or reduced tillage fields, management of anthracnose leaf blight is best achieved with rotations (avoiding second year corn) and planting resistant corn hybrids. Fungicides applications are not economical in field corn situations because more than one application is

necessary to control the disease, however, in seed corn fields fungicide applications may be cost effective, especially if a very susceptible inbred is planted into a lot of residue.

Northern Leaf Blight

Northern leaf blight has traditionally been one of the most damaging corn leaf diseases in Ontario. The disease appears as long, elliptical (2 – 15 cm) grayish-green or tan streaks. Lesions most often begin on the lower leaves. As the disease develops individual lesions may join forming large blighted areas. In some cases the entire leaves may become blighted or "burned". Losses due to northern leaf blight are most severe when the leaves above the ear are infected at or slightly after pollination. The disease is often confused with Stewart's Wilt (see section below).

The fungus survives in corn residue as either spores or fungal strands (mycelium). The spores of the fungus are spread from the ground residue to the developing corn plant through wind or rain "splashing". Although the fungus does overwinter in Ontario, a major source of spores remains the U.S. mid-west corn belt and surrounding Great Lakes states. Plants that become infected act as a secondary source of infection and may spread to other fields. Disease development is favoured by moderate temperatures (18° to 27° C) with prolonged periods of humid or rainy weather.

Figure 3. Elongated Northern Leaf Blight lesion

Crop rotation and tillage will reduce inoculum levels in surface residues. In reduced tillage systems, rotation and resistance are necessary.

Eyespot

The disease produces characteristic round or oval, spots (1 – 4 mm) with a tan/brown centre and a brown or purple margin. A translucent yellow halo forms around the margin, and when held to the sun, the lesions resemble an eye. Leaf blighting may occur when these lesions join killing large portions of leaf tissue. The disease may be confused with non-infectious physiological leaf spots or insect damage. Again this is another disease that thrives under cool, wet conditions. Resistant varieties, crop rotation and clean plowing of crop debris help to reduce disease severity.

Figure 4. Typical eye-spot symptoms

Bacterial leaf blight or wilt (Stewart's Wilt)

Late season symptoms of the diseases are pale green to yellow streaks with irregular or wavy margins that run parallel to the veins. These streaks may run the full length of the leaf. Infected leaves eventually become dry and brown. Often flea beetle feeding marks are visible within the lesions. Premature leaf death can result in reduced yield and an increase in stalk rots since weakened plants are more susceptible.

Seed corn, sweet corn are generally more susceptible than field corn and can serve as a reservoir for the bacteria. The disease is often found in the best fields and fertility seems to play a part. Susceptibility to the disease increases in fields that have high nitrogen and phosphorous levels.

Field corn has good tolerance to Stewart's wilt and therefore no control is required, but certain seed corn inbreds are susceptible and are rated for disease tolerance.

Figure 5. Stewart's Bacterial Wilt. Note the black corn flea beetle vector's

Remember it is a bacterial disease and a fungicide will not control Stewart's wilt and therefore identifying it from the fungal disease is key.

Gray Leaf Spot

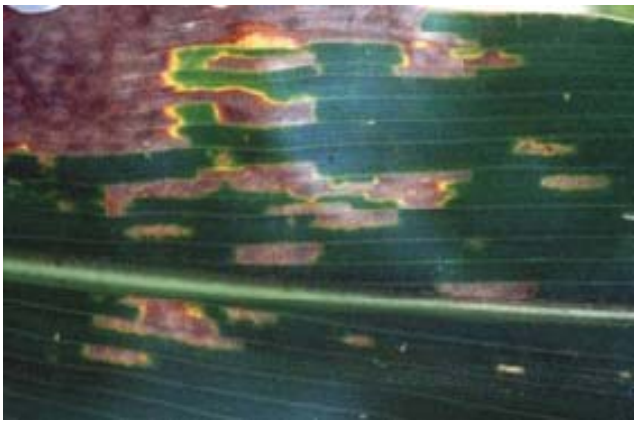


Figure 6. Rectangular lesions due to Gray Leaf Spot

Gray leaf spot is becoming more common in Ontario seed corn and field corn especially in fields that are corn after corn that contain considerable amounts of residue. The disease favours warm, wet or humid conditions.

Symptoms develop on the lower leaves soon after tasseling. The disease has unique elongated (2 to 7 cm long), narrow, light tan coloured rectangular lesions. These lesions run parallel to the leaf veins. As the lesions mature, they become gray in colour and join, killing or blighting entire leaves. It is this unique shape (rectangular) that make the disease relatively easy to identify.

Some hybrids are tolerant to the disease and crop rotation and tillage will reduce inoculum levels in surface residues. In reduced tillage systems, rotation and hybrid resistance are necessary.

Common Rust

Common rust has been found in the Chatham area already on seed corn. This disease does not overwinter in Ontario and rust spores are blown into Ontario from the southern U.S. Rust is most often a problem when spring storm fronts deposit rust spores early in the season. The spores develop and infect quickly when cool evening temperatures (14° to 18°C) are followed by moderate daytime temperatures under wet or high humidity conditions.

Rust is not hard to identify. Early symptoms of rust infection are yellow flecks or spots on either side of leaf. These develop into small, brick-red coloured pustules that break through the surface (epidermis). The brick-red colour is the result of spores being released from these oval or elongated lesions (2 - 10 mm long). Yellowing of the leaf occurs around these lesions. Dead brown (necrotic) areas of the leaf develop and in severe cases the entire leaf dies. The brick-red

Figure 7. Common rust pastules on corn

coloured spores mature and turn black as they mature causing the lesions and leaf surface to appear black.

Since common rust does not survive in Ontario, cultural practices such as reduced tillage and crop rotation does not influence disease development. Commercial corn hybrids have good tolerance whereas many seed corn inbreds, sweet corn and specialty corn hybrids are very susceptible to the disease. Foliar fungicides in field corn are not usually needed but can be economical in highly susceptible seed corn inbreds or specialty corn hybrids.

Figure 8. Common smut on corn

Common Smut

Common Smut survives in both the soil and on corn residues. Common smut loves stressed or injured plants and is often found on parts of the plant that have actively growing tissue. The disease incidence increases in fields where the plants have been wounded by hail, frost, drought, mechanical injury, detasseling, herbicide injury, insects, or sand-blasting. High levels of nitrogen and manure promotes this disease.

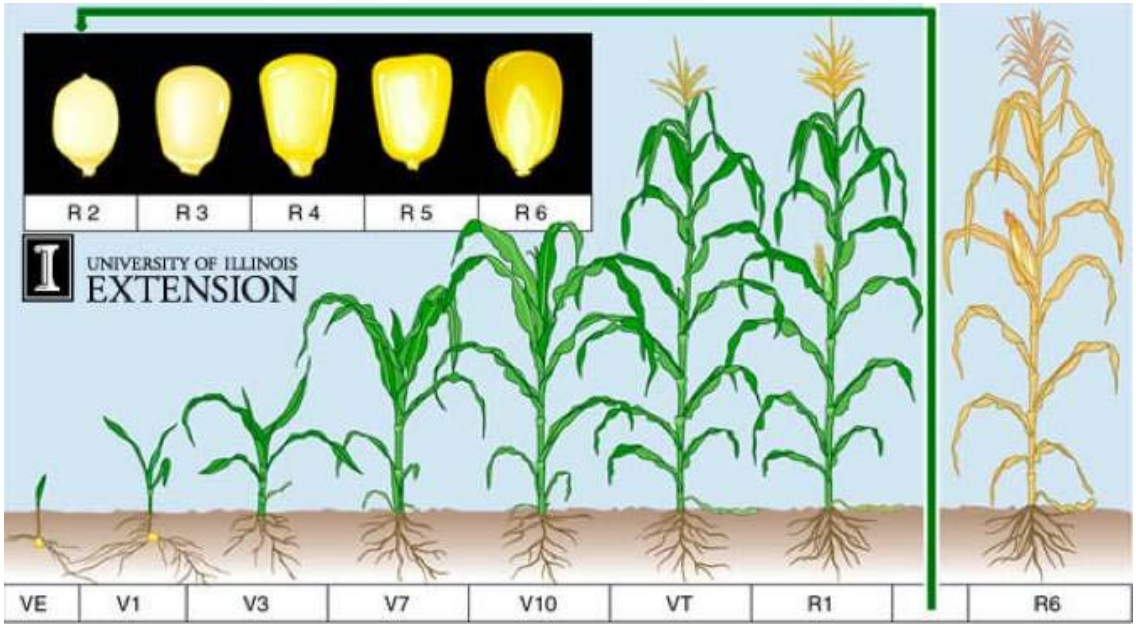
Greyish smut galls up to 10 cm in diameter develop on the stalks, ears and tassels, while smaller galls often appear on the leaves. The galls initially have a white membrane cover that eventually breaks and releases dark brown or black powdery spores. On the leaves galls develop into a hard dry growth. Smut galls can replace kernels. Unlike common smut, head smut occurs on the ears or tassels (or both) only. Disease development is favored by rain showers, high humidity, and warm temperatures.

Reduce your risk by minimizing mechanical and herbicide injury while maintaining a balanced fertility program. Rotation and cultivation have little affect on the disease since spores can survive for a long time in the soil.

These are some of the most common corn foliar diseases you may encounter this year. With a little patience and time they are not that hard to tell apart. Have fun and stay cool!

Things to Consider if Planning a Fungicide Application in Corn and Soybeans

1. Corn hybrid or Soybean cultivar susceptibility to disease
2. Conservation tillage system resulting in increased crop residues in the field
3. Planting date
4. The Crops yield potential
5. What is the disease pressure during the critical reproductive stages for corn (VT/R1 tasseling into silking) or soybeans (R1 to R3 - beginning bloom into beginning pod). Refer to Figure 1 (corn growth stages) and Figure 2 (soybean growth stages).
6. Weather conditions at the time of disease measurement and whether the forecasted weather conditions during reproductive development is conducive to further disease development
7. Fungicide and application cost
8. Grain market value



VT - Tasseling

Initiation of the VT stage begins when the last branch of the tassel is visible and silks have not emerged. This stage begins about 2-3 days before silk emergence. The plant is almost at its full height and pollen shed (anthesis) begins. Pollen shed typically occurs in the morning or evening. Plants at the VT/R1 are most vulnerable to moisture stress and leaf loss (hail).

R1 - Silking

This stage begins when any silk is visible outside the husk. Falling pollen grains are captured by the silk and grow down the silk over a 24 hour period ultimately fertilizing the ovule. The ovule becomes a kernel. It takes upwards of three days for all silks on a single ear to be exposed and pollinated. The number of fertilized ovules is determined at this stage. If an ovule is not fertilized, it will not produce a kernel and it eventually degenerates.

Environmental stress at this time is detrimental to pollination and seed set, with moisture stress causing desiccation of silks and pollen grains. Nutrient concentrations in the plant are highly correlated with final grain yield as nitrogen and phosphorous uptake are rapid.

Identifying Common Corn leaf Diseases
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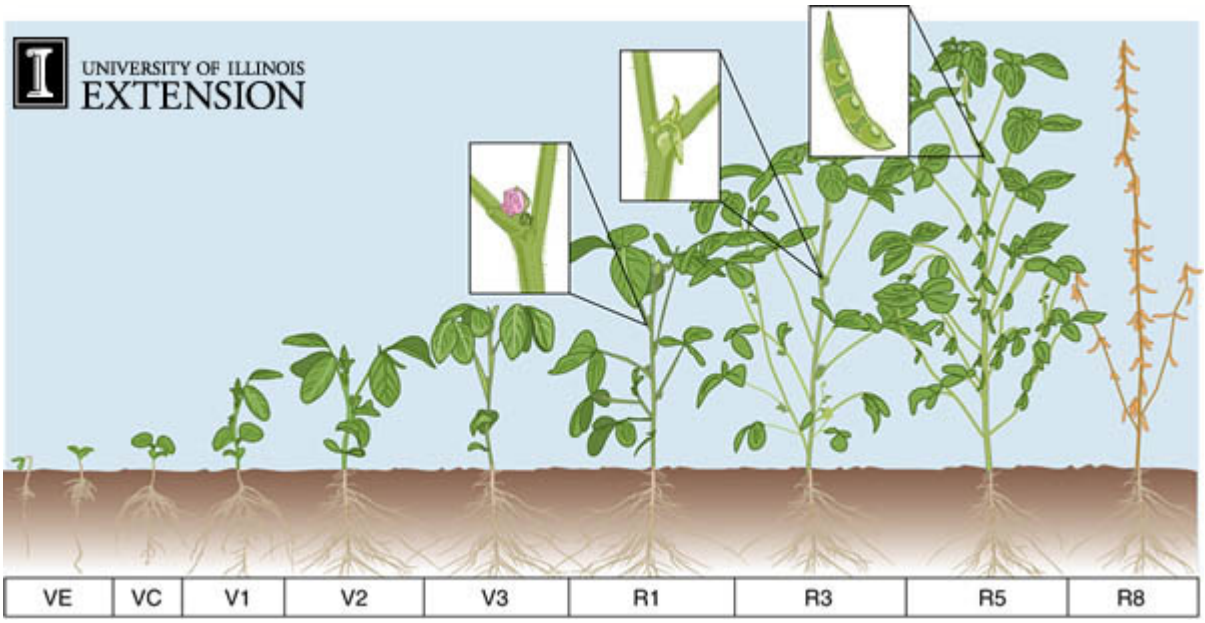

Soybean Reproductive Stages

R1	Beginning flower	Open flower at any node on the main stem
R2	Full flower	Open flower at one of the two uppermost nodes on the main stem
R3	Beginning pod	Pod is 5 mm (3/16 inch) long at one of the four uppermost nodes on the main stem.
R4	Full pod	Pod is 3/4" long at one[p of the four uppermost nodes on the main stem with a fully developed leaf.
R5	Beginning seed	Seed is 1/8" long in a pod at one of the four uppermost nodes on the main stem.
R6	Full seed	A pod containing a green seed that fills the pod cavity is located at one of the four uppermost main stem nodes.
R7	Beginning maturity	One normal pod on the main stem has reached its mature pod color.
R8	Full maturity	Ninety-five percent of the pods have reached their mature pod color.

Western Bean Cutworm Update

Tracey Baute, Field Crop Entomologist, OMAFRA, Ridgetown

From the…… BauteBUGBlog.com

The Midwest is alive with WBC moths. Moths have been captured this year much earlier and in higher numbers in Michigan, Ohio, Ontario and Pennsylvania. Current Trap Catch Maps are available at: Ontario Michigan Ohio (http://www.msuent.com/trapnetwork/web/overview/map)

This increases our risk of having eggs laid in corn, since corn was planted so early this year and is in the ideal stage that the moths are attracted to. Moths like to lay their eggs in corn before it tassels.

Scouting for eggs should start in early July. Eggs are laid on the upper surfaces of leaves and are usually on new vertical leaves near the whorl. There are typically 20-200 eggs per mass and are pearl white when first laid. Their colour then ages to a tan and then purple just before they hatch, which is usually in about 6-7 days.

Scout 20 plants in 5 areas of the field. If 5% of the plants you scout have egg masses on them, spray is necessary. But call or email me first. **WE WANT YOUR WBC EGGS!** Jocelyn Smith at UGRC will be conducting trials this year and we need WBC eggs to be able to do the research. We would be happy to come and take the eggs away for you.

Figure 1. Freshly laid Western Bean Cutworm eggs