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Taking That Fall Cutting of Alfalfa?

Joel Bagg, Forage Specialist, OMAFRA, Lindsay

With reduced forage inventories, it will be very tempting to cut some alfalfa for haylage or baleage this fall. This difficult decision will need to weigh the immediate need for forage against the increased risk of alfalfa winterkill and reduced yields next spring. How do we evaluate these risks?

Alfalfa Stands Significantly Stressed In 2012

At the same time our alfalfa stands have been stressed to the limit, we are going to ask them for more. Alfalfa has suffered significant stresses that go back to last fall and winter. Saturated soils in late fall, poor winter hardening, water ponding and ice sheeting all took their toll, as well as alfalfa crown and root diseases. As spring approached, we had multiple incidents of frost damage. A very dry April and May, and alfalfa weevil significantly reduced 1st-cut yields. This was followed by exceptionally poor 2nd-cut regrowth with little rain in June and July. Potato leafhopper has taken an incredible toll, especially to new seedings.

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Taking That Fall Cutting of Alfalfa?
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A major contributing factor to poor 1st cut yields is always cutting alfalfa during the fall. With forage inventory shortfalls, it is understandable why many take that risk. However, we have been seeing more winterkill recently, even in areas where it is less common. Stressed, weakened stands are at a greater risk of continued decline and poor yield. Digging some alfalfa crowns and roots and doing an assessment for disease and plant health can help in making fall cutting and rotation decisions.

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Critical Fall Harvest Period

The Critical Fall Harvest Period for alfalfa is the 6-week rest period (450 Growing Degree Days) preceding the average date of killing frost. Not cutting during this period allows alfalfa plants to re-grow and build up sufficient root reserves to survive the winter and grow more aggressively in the spring. When cut, early in the period, the alfalfa will use the existing root reserves for regrowth, "emptying the tank". Later in the period, the alfalfa uses photosynthesis to produce carbohydrates and stores them as root reserves, "refilling the tank".

Cutting in the middle, of the Critical Period (3rd or 4th week), when root reserves have been depleted and not yet replenished, is usually higher risk than cutting at either the beginning or end of the Period.

Taking That Fall Cutting of Alfalfa?
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The Critical Fall Harvest Period begins as early as August 10th in northern Ontario, August 25 – 30th for eastern and central Ontario, and September 4th in the southwest (Figure 1). However, it is difficult to predict when that killing frost will actually occur. The actual date seldom occurs on the average date, so the beginning of the Critical Fall Harvest Period is a guideline only.

Even when winterkill does not occur, the extra yield harvested during the Critical Period is typically offset by reduced vigour and lower 1st-cut yields the following spring. It can sometimes be difficult to observe, but still be significant. Research shows that the yield sacrificed by not harvesting during the Critical Period is usually regained in first-cut yield the following year. We certainly saw this effect in the spring of 2012. The decision to cut should always be weighed against the immediate need for forage. If you do decide to cut, consider leaving some check strips that you can use for comparison next year.

Other Contributing Risk Factors

Fields with older stands, a history of winterkill, low potassium soil tests, low pH, poor drainage, or insect and disease pressure are at increased risk of winterkill and are poor candidates for fall harvesting. Aggressive cutting schedules with cutting intervals of less than 30 days between cuts increases the risk of winterkill, while intervals over 40 days (allowing flowering), reduces the risk. We frequently see fields with disappointing 1st-cut yields where 4th-cut was taken the preceding fall.

Some areas of the province, such as the Ottawa Valley, have a higher historical risk of winterkill. In situations where forage inventories are adequate, increasing the risk of winterkill by fall cutting is far less acceptable.

Late Fall Cuttings At The End Of The Critical Fall Harvest Period

If fall harvest must be done, risk of winterkill can be reduced (but not eliminated) by cutting towards the end of alfalfa growth, close to a killing frost. Little root reserves will be depleted by regrowth, but lack of stubble to hold snow to insulate the alfalfa crowns against damage during cold weather may be a problem. Increasing cutting height to 6 inches of stubble will help. Try to limit late cuttings to fields that are otherwise lower risk – well drained, good fertility, healthy crowns and roots, etc. A killing frost occurs when temperatures reach -4°C for several hours. After a killing frost, alfalfa feed value will quickly decline, as leaf loss occurs and rain leaches nutrients quickly.

Insufficient top growth and snow holding capacity can also contribute to alfalfa frost heaving. Stubble will protrude through winter ice sheeting, should that occur. Cut alfalfa initiates regrowth from crown buds and axillary buds, not the cut end of the stem, so cutting higher does not reduce usage of root reserves. However, cutting higher does allow for holding more snow as insulation.

Smothering?

There is always the question of smothering in heavy forage stands that are left unharvested. Heavy stands of grasses or red clover can sometimes smother over the winter because the top growth forms a dense mat. In contrast, alfalfa loses most of its leaves as soon as there is a hard frost, and the remaining stems remain upright and seldom pose any risk of smothering.

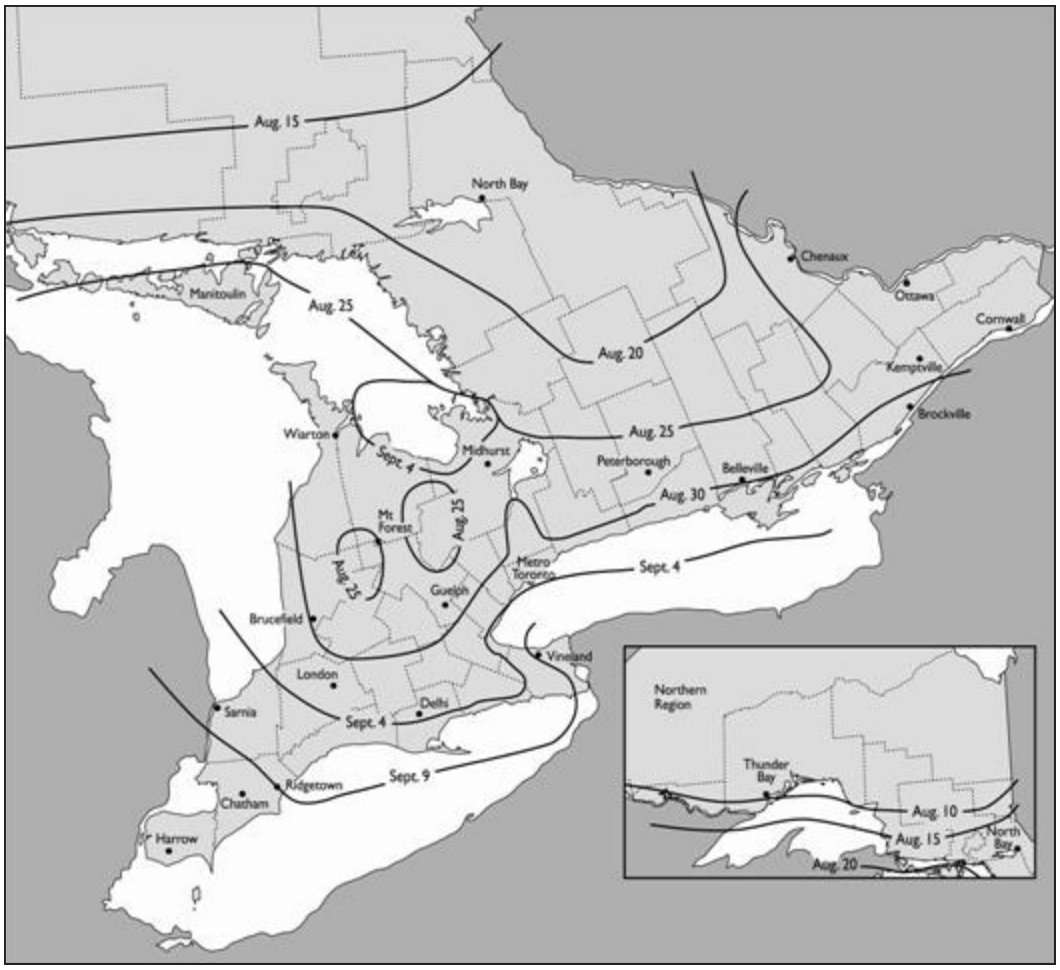

Figure 2. Start of the six-week alfalfa critical fall harvest period.

Double Cropping Fall Rye For Extra Forage

Joel Bagg, Forage Specialist, OMAFRA, Lindsay

Fall rye can be used as an excellent emergency forage crop, by seeding after early-fall harvested crops and making haylage, or by grazing in the spring. Because it is typically harvested in southern Ontario in mid-May, there are opportunities to include it in "double crop" systems to fill the gap in years when forage supplies are short. Seed as early as possible in September, apply nitrogen in the spring, and time harvest for nutrient quality needs. Do not confuse cereal rye (*Secale cereale*) with ryegrass (*Lolium multiflorum or L. perenne*), which are totally different grass species with quite different characteristics.

Fall rye is best known as a cover crop that prevents erosion and gives good weed suppression. Rye is very cold tolerant, the hardiest and most disease resistant of the winter cereals. Fall rye has an extensive fibrous root system, can scavenge nitrogen very effectively, and utilizes early spring moisture to grow rapidly. Fall rye is faster growing and earlier maturing in the spring than the other winter cereals, including wheat, barley and triticale. This enables an earlier forage harvest and more "double crop" options.

Fall rye grows well on lighter and low pH soils, but does not do well on poorly drained, heavier soils. Forage rye is higher yielding, but not as palatable as winter wheat. Rye matures rapidly at the flag-leaf, boot and early-heading stages, with significant reductions in forage quality. This can create the challenge of a very narrow harvest window, particularly if there are rain delays.

Double Crop Options

Farmers looking for extra forage can plant fall rye following the harvest of many crops, particularly corn silage. Forage rye harvested in mid-May can be followed by a late-planted crop, such as soybeans, edible beans, or a warm-season annual forage crop such as sorghum. Winter wheat heads later than fall rye, about June 5th, making forage wheat harvest too late to be followed by corn or soybeans. Decreased moisture in the soil profile following forage rye harvest can potentially have a negative effect on the yield of the following crop. It is essential to completely kill the rye with glyphosate or tillage to minimize shading and competition for moisture.

Rye is sometimes noted for having an "alleopathic effect" that suppresses the germination and growth of weeds and other crops. With most of the rye residue removed, alleopathy is a low risk in most forage rye situations. The possible exception may be with no-till corn on heavier soil types.

Seeding

Fall rye is easy to establish and can be seeded from late-summer to late-fall. If harvest as silage the following May is planned, fall rye should be seeded in September, but later seedings can work on sandy soils. Early planting allows more time for tillering, higher forage yields, and slightly earlier forage harvest dates. Some growth going into winter is required for early spring growth and good yields. Seed is relatively inexpensive. Under good conditions, fall rye can be seeded at 110 kg/ha (100 lbs/ac), but the seeding rate can be increased up to 190 kg/ha (168 lbs/ac, 3 bu/ac) if the seed is

Double Cropping Fall Rye For Extra Forage
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broadcast rather than drilled, or if the seeding date is late.

Grazing

Fall rye is best used to provide early-spring grazing, but can also be grazed into late-fall. It is ready to graze early in the spring and growth is very rapid. To ensure that it does not get too mature, be prepared to move livestock frequently by strip grazing. Grazing rye on wet heavy clay soils in late-fall or early-spring is not recommended due to livestock "pugging" and compaction. If fall pasture is desired, fall rye should be seeded by August 15-30th.

Haylage

Fall rye can be made into good stored feed by making it into silage, either in tower, bunk, pile, bag silos, or as baleage. Fall rye cut at the desired stage is extremely difficult to dry sufficiently to be made into dry hay. Nitrogen applied at 55 – 80 kg/ha (50 – 70 lbs/ac) in the spring at green-up will stimulate tillering and increase forage yield.

The timing of cutting is critical. Quality, palatability, and intake drop very quickly at the heading stage (faster than other cereals) so the optimum harvest window is very narrow. It is recommended to target harvesting forage rye at the **flag-leaf** or **early-boot stage** for high nutrient quality. Early-boot generally occurs May 10th – 20th in southern Ontario. At this stage, a dry matter yield of 2 tonnes per acre or more is possible under good conditions.

There can be a very large range in forage quality with only a few days difference in harvest. At the early-boot stage (Zadok Stage 39 – ligule of the last leaf just visible), crude protein (CP) can approach up to 18% (depending on the amount of nitrogen applied), with Neutral Detergent Fibre (NDF) under 50%.

At the head-emerged stage (Zadok Stage 55), CP drops to the 13 – 14% range, while NDF increases to over 60%. This will likely be adequate for beef cows, heifers, and dry cows, but will not be high producing dairy cow or sheep quality.

When rye is cut later, at the early-dough stage, the yield may approach 3 tonnes per acre, but the quality, palatability and intake will be much lower. Delaying forage rye harvest past the boot stage because of bad weather or competing field crop activities is not very forgiving.

Winter Triticale

Winter triticale, a cross between rye and wheat, has been suggested by Tom Kilcer in New York State as being preferable in both forage yield and quality to either fall rye or winter wheat. His research indicates that winter triticale harvested at the flag-leaf stage (rather than boot-stage) can be very high quality feed for dairy cows. There is limited data evaluating the agronomics and nutrient quality of winter triticale in Ontario. Seed is difficult to source and more expensive than rye. Harvest of triticale will be slightly later than rye at the same stage of maturity, which may delay planting of the subsequent crop.

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Double Cropping Fall Rye For Extra Forage
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While there is good potential for triticale as an Ontario forage crop, farmers interested inforage triticale may want to try rye as well and evaluate them in their own systems.

Summary

Seeding fall rye for forage can be an excellent, cheap source of additional feed. Seed as early as possible in September, apply nitrogen in the spring, and time harvest for nutrient quality needs. By double cropping, rye can fill the gap on years with short forage supplies, or be a regular part of the rotation.

The ULTIMATE Opportunity - Plant Wheat!
Peter Johnson, Provincial Cereal Specialist, OMAFRA, Stratford

Harvest is EARLY! The window of opportunity for early planted winter wheat has never been bigger or better. Early planted wheat means HIGH YIELD potential! What are the management "musts" to maximize the probability of high yields?

1. **Plant Wheat!**
   Prices are high, straw is in high demand, and the rotational benefits have never been more evident. Add to this the double crop opportunities of oats for forage after harvest, a place to spread manure, and more acres with the same equipment.

2. **Seeding Rates**
   Wheat planted early yields more, with less disease, at lower seeding rates. Talk about a win-win. Pay less for seed and get more yield. Do not seed more than 1.2 million seeds per acre if you are 10 days or more ahead of normal. If you are really early, 1.0 million seeds/ac is more than enough.

3. **Seed Treatments**
   Early planted wheat is at higher risk for Barley Yellow Dwarf Virus, which is spread by aphids. While this is rarely a problem in Ontario, extra early seeded wheat is at higher risk. Consider a seed applied insecticide (Cruiser, Stress Shield) to control aphids if planting is extremely early (or if European Chafer is an issue).

   Early planted wheat is also at higher risk for snow mould injury. The new seed treatment "Sedaxane" (included in Vibrance XL) is reported to have increased control of snow mould, so inclusion of this active may prove beneficial. Note that there is no Ontario data to date supporting this claim.

   Difenoconazole (included in Dividend XL RTA and Vibrance XL) is always a must on all winter wheat seed in Ontario, to control soil borne dwarf bunt.

4. **No Fall Nitrogen or Sulphur!**
   Our research in Ontario has found absolutely no benefit to fall nitrogen or suphur. Fall nitrogen is simply throwing money away, and causing an environmental risk. Fall sulphur (elemental or in MESZ) has added cost with no yield benefit. Fall phosphorus pays, fall N and S do not.

The ULTIMATE Opportunity - Plant Wheat!
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5. **Rotation**
   The best rotation? Wheat after peas, canola, and edible beans! It will be extremely tempting to plant wheat following silage corn, hay or pasture. Remember the risks.

   -**Fusarium** is at maximum risk after any type of corn, silage or grain. If you must plant after silage, plant a Moderately Resistant variety and plan to spray a fusarium fungicide.

   -**Take-All** risk in wheat increases significantly following grassy hay or pasture. Try not to plant too early, and seed place 50 lbs/ac of muriate of potash (0-0-60). The chloride in the potash will offer some Take-All suppression (40%).

6. **Basic Management Applies**
   You cannot have MEGA wheat yields if you don't do the basic things right!

   - seeding depth at a minimum of 2.5 cm (1 inch), but into moisture (unless over 7.5 cm or 3 inches),
   - seed placed starter fertilizer,
   - fall weed control,
   - tile drainage,
   - all those things that normally work still apply to early seeded wheat.

7. **PLANT WHEAT!**
   Wheat helps drought proof your rotation, spreads the workload, and offers excellent opportunities to control weeds that otherwise escape. And wheat makes money.

Spider Mites Reduced Soybean Yields in 2012

Horst Bohner, Soybean Specialist, OMAFRA, Stratford
Tom Cowan, Field Crop Entomologist, OMAFRA, Ridgetown

Two-spotted spider mites were a problem across much of the province in 2012, causing significant yield reductions in some soybean fields. With extremely dry areas the worst hit, 2012 was the most widespread and severe mite infestation experienced in recent memory.

Damage
Spider mites feed through stylet-like mouthparts on the underside of leaves. Each feeding site causes a stipple. Severe stippling causes yellowing, curling and bronzing of the leaves. (Figures 1, 2 & 3). Eventually, the leaf will dry up and fall off. (Figure 4) Close examination will show fine webbing on lower surfaces of the foliage. Adults, nymphs and larvae all feed on the plant and contribute to the overall damage.

Damage is more severe in hot, dry weather and usually occurs in mid-July (after winter wheat harvest). Spider mites usually start at the edges of the field, but windy days can carry them in from other sites, with pockets starting up deeper into the field. In 2012 mite infestations often quickly spread across entire fields, creating visual "hot spots". From the road, these pockets may be confused with drought stress. High-risk factors include neighbouring

winter wheat stubble, hay fields, ditch banks and fencerows that harbour over-wintering mites. No-till fields of soybeans following winter wheat underseeded to red clover are also at higher risk, as over wintering mite populations may be present. In 2012, some counties had such high numbers that essentially all fields were impacted to some extent. Heavy damage could be found along field edges and in hot spots throughout fields.

Description and Life Cycle

The adult spider mite is barely visible to the naked eye, only 0.5 - 1.0 mm (1/25th inch.) in length. They are rounded, eight-legged and yellowish-brown with two dark spots on the sides of the abdomen. (Figure 5) Adult females produce eggs that, depending on temperature, can hatch in 4 - 5 days, and larval spider mites emerge. The larvae are very small and look similar to the adults except that they only have 6 legs instead of 8. The nymphs then go through 2 larval stages growing larger each time, acquire an extra set of legs and begin to develop the two dark spots on either side of their abdomen. As day lengths shorten and food supplies run low, over-wintering females begin to turn an orange-red colour. In very hot years, the entire life cycle can be completed in just over a week.

Spider mites generally over-winter as adult females in sheltered areas, such as plant debris and field margins. Harvested wheat fields underseeded to red clover are another important over-wintering site. In late-April, as the weather turns warm, mites become active in search of food and egg-laying sites. Spider mites disperse by crawling, so infestations tend to spread slowly from field edges (Figure 6). Spider mite females can reproduce without mating. A single unmated female can be the start of a new colony. Non-mated female mites will mass at the top of plants and spin webs that serve as "balloons" that allow strong winds to pick them up and carry them off to another site. Under hot, dry, windy conditions, infestations can spread very quickly. There can be up to seven generations per year, with generations overlapping.

Frequent rain and cool weather reduce mite populations in soybeans by facilitating the development of fungi that infect the spider mites. Cooler weather also helps slows down the reproductive cycle. A single rain event followed by hot weather will not do much to reduce mite numbers. Continued rain and cool weather are needed for a few days to help the fungi gain a foot-hold in the mite population.

Scouting Technique

Scout fields weekly, starting the first week of July. Infestations tend to occur shortly after wheat harvest, and when municipalities mow roadsides. Infestations usually move in from the edges of fields. Look for tiny white stipples on the upper surface of leaves in the mid-canopy. Pull these leaves from the plant and shake them onto a white piece of paper to see the actual mites moving around. To the naked eye, they look like small pieces of dirt moving on the white paper. A 10X hand lens is required to actually see the mites. If you suspect that rain and cooler weather has helped to reduce mite populations, check to see if mites are still alive on the leaves. Using a hand lens, gently disturb the mites. If adults and nymphs do not move, they are dead.

Action Threshold

Control is necessary if there are four or more mites per leaflet, or one severely damaged leaf per plant prior to pod fill.

Management Strategies

- An insecticide may be necessary when mite numbers exceed the action threshold. Only dimethoate is currently registered for use on soybeans. Under severe infestations, 80 - 90% control can be expected, but this may still leave a tremendous number of mites. Control was disappointing in some fields in 2012. More research is needed to assess the efficacy of other insecticide products and get them registered on soybeans.
- Spraying the edges of a field helps prevent the early infestation spread of mites to other parts of the field and may reduce the need for further treatment. This strategy works most years, but in 2012 populations were so severe that it was often insufficient.

- If rain is in the forecast, delay spraying. Prolonged wetness and colder temperatures will usually reduce the number of mites to insignificant levels.
- Natural enemies of spider mites, including ladybird beetles, thrips and predaceous mites, help keep mites at low levels when conditions are favourable. Cool temperatures and high humidity promotes the development of a pathogen that can also provide natural control.

Figure 1: Bronzing of underside of soybean leaf. High population of spider mites present

Figure 2: Stippling of soybean leaf from spider mite feeding

Figure 3: Curling of soybean leaf from spider mite feeding

Figure 4: Defoliation from heavy spider mite feeding

Figure 5: Spider mite life stages: Adult (left) nymph (centre) and egg (right)

Figure 6: Heavy damage to field edge from spider mite feeding

Silo Gas Alert

Joel Bagg, Forage Specialist, OMAFRA, Lindsay

There is increased potential for high nitrates and therefore silo gas (nitrogen dioxide) in recently harvested corn silage due to the dry growing season this year.

Farmers exposed to silo gas are at risk of severe respiratory distress, permanent damage to lungs, and even sudden death.

Reports of silo gas are coming in. Some of the corn in these silos did not appear to be severely stressed in the field. Precautions should always be taken in tower silo situations.

Silo gas is produced almost immediately after filling a silo. The greatest risk is the first 12 to 60 hours after filling the silo, and then risk declines for approximately 4 – 6 weeks when silage fermentation is complete. Silo gas has a bleach-like odour and may be visible as a reddish-brown haze. However, it is not always visible.

Nitrogen dioxide is heavier than air, therefore it tends to be located just above the silage surface. It may flow down silo chutes and into feed rooms. Tower silos are at greater risk because the silo gas is contained at the silage surface level, and operators often enter the silo after filling to level silage and set up the unloader.

When inhaled, nitrogen dioxide mixes with body moisture to form nitric acid which causes severe burning of the lungs and the rest of the respiratory system. Pulmonary edema results. Victims often collapse. Other people attempting a rescue can also be overcome. Farmers exposed to silo gas should get immediate medical attention.

For more information on preventing injury or death from silo gas, refer to:

- Silo Gas Dangers – Workplace Safety and Prevention Services http://www.farmsafety.ca/public/factsheets/silo_gas_dangers.pdf
- Silo Safety – Workplace Safety and Prevention Services http://www.healthandsafetyontario.ca/HSO/media/WSPS/Resources/Downloads/Silo_Safety_Final.pdf?ext=.pdf
- Hazardous Gases – OMAFRA Factsheet 04-087 http://www.omafra.gov.on.ca/english/engineer/facts/04-087.pdf
- Farmers with concerns about silo gas should contact the Workplace Safety and Prevention Services, (formerly the Ontario Farm Safety Association) at 1-877-494-9777.

Do not enter a silo during the risk period without wearing an appropriate self-contained breathing apparatus. Before entering the silo, ventilate it by running the forage blower for 30 minutes and leave it running while inside. Also ventilate the silo room and chute. Post appropriate warning signs, and keep people and animals away.

Mark your Calendars for the Southwest Agricultural Conference—2013!

Thursday, January 3 and Friday, January 4, 2013

First Confirmation of Soybean Vein Necrosis Virus In Ontario

Albert Tenuta, Field Crop Pathologist, OMAFRA, Ridgetown

The University of Guelph Pest Diagnostic Clinic confirmed this week Soybean Vein Necrosis Virus (SVNV) infection in soybean plants I collected in Kent and Elgin counties last week. SVNV is a new soybean disease which was first identified in Tennessee in 2008. Since then the disease has been reported in many other States and most recently in bordering Great Lake States such as Ohio, New York and Michigan.

The disease has most likely been present in soybeans for many years but could have gone misdiagnosed since symptoms look very similar to Cercospora leaf blight (Cercospora kikuchii), scald (sunburn), plant stress response and others. Symptoms often begin as chlorotic (light green to yellow) patches near the main veins which may enlarge eventually becomimg necrotic (brown) areas. The veins may appear clear, yellow or dark brown in colour. The browning of the veins may be especially noticeable on the lower leaf surface but this may not always occur.

What is SVNV? The virus belongs to the Tospovirus group which includes Tomato Spotted Wilt Virus which are vectored by thrips and possible other insects. The hot and mostly dry conditions this year were good for not only spider mites but thrips as well. There is not a lot known about SVNV and many questions need to be answered before we get a better understanding of the potential impact of this new disease in Ontario.

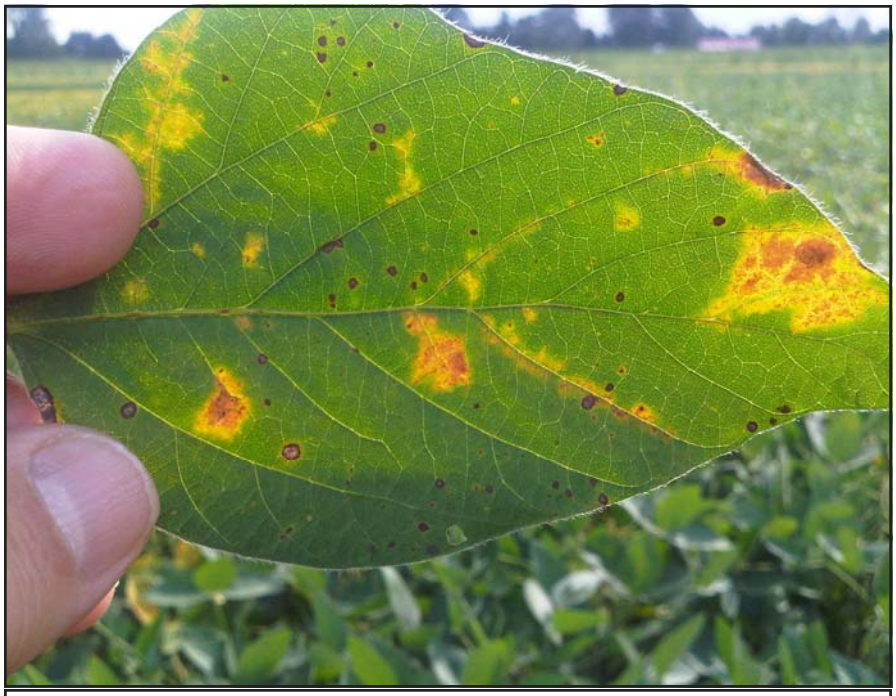

Figure 1. Soybean vein necrosis virus infection – Note yellowing of the veins and tissue. Photo Albert Tenuta, OMAFRA, 2012.

Figure 2. Soybean vein necrosis virus – As disease progresses, necrosis of area around veins occur. Veins often look clear from above and dark from the underside of the leaf. Photo – Albert Tenuta, OMAFRA 2012