The Bean Report

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MANITOBA Pulse & Soybean GROWERS

THIS ISSUE...

QUICK LINKS

- Edible Bean Grade Determinant Tables
- Desiccant Use and Market Risks
- Soybean Maturity Guide

Figure 1. Time to scout for soybean cyst nematode in high risk areas: fields with frequent soybean in Red River Valley and along the US border.

Crop Update and Scouting Activities

SOYBEANS are at R5 (early seed) to R6 (full seed) growth stage, with some pre-mature ripening occurring in some fields. Physiological maturity (R7) occurs when the majority of pods are yellow and at least one pod on the main stem is brown; this begins to occur in early to mid September in Manitoba.

The seed fill period (R5 to R6) is the longest growth stage in soybean and lasts nearly a month. This is the stage where yield estimates can begin. Yield estimates consider the number of plants, pods and seeds per plant and seed weight. The MPSG Bean App features a Yield Estimator tool and is available for free download. Yields are expected to be variable this year. There will be yield losses primarily due to excess moisture which has led to large drowned out areas of fields, root rot and *Sclerotinia* white mould. Hail damage has also been a limitation.

This time of year, soybeans should be scouted for root and stem diseases to understand what could impact seed quality and to determine if a change in management or variety is required for future years. For example, the importance of identifying *Phytophthora* root rot is described on page 3. Measuring white mould incidence (% of plants affected) is also helpful; if >10% of plants are affected, a 3-5 bushel yield loss is likely. Inspecting stems externally and internally by slicing with a knife can also reveal some important information. An excellent article describing late season soybean diseases is available here.

DRY BEANS are in various stages of colour change and cutting and harvest is underway in southern Manitoba. Beans are moving from R7 (no yellow) to R8 in about 10 days. Reproductive stage R8 is reached when leaves begin yellowing over half the plant and is about 5-7 days from being mature. Stage R9 describes mature beans and occurs when at least 80% of pods show yellow and are mostly ripe. As you consider desiccation options in beans, be sure to communicate with your buyer to address any potential market concerns.

Bacterial blight and white mold continue to impact bean fields. White mould incidence has been observed as high as 30% and is being observed at high levels even in fields treated with fungicide. Gray mould caused by *Botrytis cinerea* has also been found. For mould infected fields, rotation to non-host crops for at least 3 years is suggested.

To learn about how disease resistance in being incorporated into dry bean varieties, join us for the Morden Pulse Tour *tomorrow morning* (August 23) at 8:30 am. Details here.

FIELD PEAS

Pea harvest is wrapping up in both eastern and western Manitoba. Preliminary yield reports have generally been lower than expected, ranging from 20 to 40bu/ac. Excess moisture and weather damage, especially in July may have contributed to the onset of severe bacterial blight and root rots in some fields, limiting seed set and yield potential.

Desiccation in Dry Edible Beans

Approximately 60% of dry bean farmers direct harvest at least a portion of their bean acres and use a desiccant to facilitate uniform dry down, control weeds and allow timely harvest. Glyphosate and Heat are the most commonly used products by Manitoba growers.

Desiccant timing

Desiccants do not bring about or speed up dry bean maturity[1]. Proper timing is critical to prevent yield and quality loss and to prevent residue accumulation in the seed which can affect marketability. In fact, research has shown that even with properly timed application, desiccant use tends to decrease seed weight and yield relative to untreated beans although the differences are usually small.

The proper application timing is when the plant is physiologically mature and the seed moisture is <30%. Visually, desiccant timing can be described by 80% pod colour change (PCC) and 80-90% leaf drop (**Figure 2,3**).

A review of product performance

From 2010-2012, a dry bean desiccation study[2] evaluated the effect of tank-mixing different contact herbicides (Aim, Reglone, Valtera and Heat) with glyphosate on yield, weed control, seed quality and residue accumulation. Glyphosate is slower acting but is a common product due to its systemic activity resulting in good control of winter annuals and perennials. Tank-mixing with a contact herbicide can provide more rapid crop dry down of the crop and annual weeds.

Heat (saflufenacil), Reglone (diquat) and Valtera (flumioxazin), had the highest dry down of pod, stem and leaf material at 4 and 8 days after application (DAA). All were superior compared to glyphosate applied alone. For example, tank-mix combinations provided 87% leaf desiccation compared to 67% with glyphosate alone 8 DAA.

Heat (saflufenacil), Reglone (diquat) and Valtera (flumioxazin) alone or in combination with glyphosate provided consistent desiccation of dry bean and adequate dry down of redroot pigweed, lambsquarters and green foxtail. Adding a tank-mix partner to glyphosate significantly increased weed desiccation at 4 and 8 DAA. For example, tank -mix combinations provided 68% weed desiccation of redroot pigweed compared to 44% with glyphosate alone at 8 DAA.

Figure 2. Desiccation timing at 80% pod colour change (PCC), 80-90% leaf drop and <30% seed moisture.

At the Manitoba site[3], Reglone (diquat) and Heat (saflufenacil) tank-mixed with glyphosate provided the most consistent results for preventing glyphosate residue accumulation in dry bean seed while facilitating desiccation and adequate late season weed control.

What about biennial wormwood and kochia?

There is significantly less literature available on the efficacy of desiccation products to control these difficult-to-manage weeds. Glyphosate, with systemic movement may reduce seed viability in future years but satisfactory control should not be expected.

For more detailed information on the how desiccation works and efficacy results in dry edible beans, click here.

[1] Gaulthier J. and R. Gulden. 2016. The science and art of dry bean desiccation. Crops and Soils Magazine. Available online.
[2] Soltani, N., Blackshaw R. E., R. E. Gulden, R. H. Gillard, C. L., Shropshire, C. and Sikkema, P. H. 2013. Desiccation in dry edible beans. Cdn. J. Plant Sci. 93: 871-877.
[3] Waddell, K. 2013 The Evaluation of Harvest Aid Herbicides for Dry Bean (*Phaseolus vulgaris L.)* Production in Manitoba. Print. Thesis. University of Manitoba.

45% PCC - NOT Ready | **65% PCC—NOT READY** | **80% PCC—READY**

Figure 2. Field view of dry beans at various stages of pod colour change (total days elapsed is 10-14 days).

Identification of Phytophthora Root Rot and Future Management

Persistent moist soil conditions throughout the province has led to root rot in soybean. *Phytophthora* and *Fusarium* typically cause root rot late in the growing season.

What is it?

Phytophthora root rot is a fungus-like pathogen that is specific to soybean. It is the no. 2 yield robbing disease of soybean worldwide. The soil-borne pathogen can remain dormant for several years, waiting for ideal conditions to germinate. Ideal conditions include warm (25-29°C), wet soil. Swimming spores are attracted to soybean roots, colonizing root and stem tissue.

Symptoms

The pathogen can attack at any time during the growing season, disrupting water movement, resulting in sudden wilting and death of the plant. Key characteristics are leaves that remain attached to the stem and a brown lesion on the root that extend upwards from the soil line. Infected plants may be random throughout a field, and/or concentrated near low spots. In fusarium infected plants, there is often a pinkish discolouration on the outside or inner part of the stem near the root base.

How to manage?

Variety selection is the best management tool. Several resistance genes are available in today's varieties that can reduce infection.

Seed treatments will protect against early season *Phytophthora* (2-3 weeks beginning at seeding).

Good crop rotation practices will help reduce inoculum level in the soil.

Figure 4. *Phytophthora* affected plants show wilting and stem lesion at soil line.

If Phytophthora is a problem in your fields, check if the variety being grown has resistance or in future years, choose a variety with resistance. Genetic resistance information can be found in the Variety Evaluation Guide on page 4 in the last column called "Notes".

Scouting for Soybean Cyst Nematode in High Risk Areas

Soybean cyst nematode (SCN) is a very important economic pest of soybean that is at our doorstep. It is expected to be found in Manitoba as soybean production intensifies and because the pest is spread easily by soil, water and equipment. The distribution of SCN in North Dakota is widespread, including several counties which border the Emerson/Altona/Winkler area of Manitoba.

Field surveys by Dr. Mario Tenuta have not yet detected SCN in Manitoba but we are encouraging farmers in high risk areas to scout for the cysts on soybean roots. SCN may be present and causing yield loss even without above-ground symptoms. It is expected that SCN will first be detected in the Red River Valley or municipalities bordering North Dakota.

You should scout for SCN in your soybeans if these three factors apply:

- ⇒ You are located in the Red River Valley or along the US Border
- ⇒ You have a crop rotation that consists of frequent soybean and/or dry bean
- ⇒ You suspect declining yields or pre-mature ripening for no obvious reason

Scout for SCN by gently digging up roots

According to Iowa State University, fields can be scouted for SCN up to three weeks before harvest; in Manitoba scouting can take place throughout August. To scout for SCN:

1. Go to high risk areas of the field (near field entrances, poor yielding areas, low spots etc.).
2. Gently dig up roots with a shovel and gently shake off soil, or rinse them in water.
3. Carefully inspect the roots for very small lemon-shaped cysts (**Figure 5**).

If you suspect SCN in your field, please contact MPSG.

For more info on SCN scouting, click here.

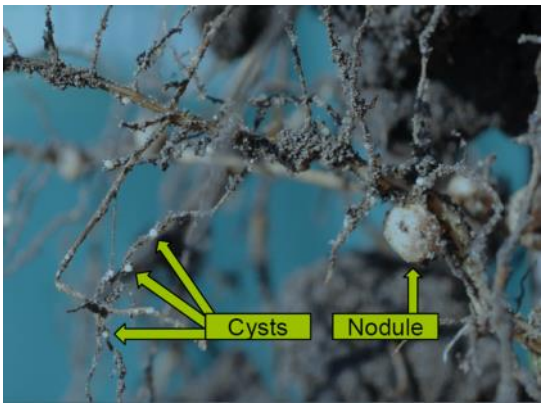

Figure 5. Cysts are very small relative to nodules (photo: Sam Markell, NDSU).