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Soybean Planting Date by Maturity Group Considerations for 2015

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Early May planting in Wisconsin has been documented to increase soybean seed yield due to increased light interception (Gaspar and Conley, 2015). In theory, earlier planting can potentially intercept greater amounts of solar radiation due to a longer growing season and therefore longer maturity group (MG) soybean varieties may be better suited to maximize yield if they can mature before a hard fall frost. Unlike 2013 and 2014, 2015 may provide growers with an opportunity to plant their soybean crop earlier than ever before. Yet, in some instances (weather or logistical problems) planting will be delayed or replanting may be needed. Therefore, investigating the effect of different MG's at multiple planting dates across the state would provide WI growers with BMP's for soybean establishment regardless of planting timing.

To answer this question field trials were initiated at Arlington, Hancock, and Spooner, WI in spring of 2014. The five planting dates at each location were planting roughly on: (1) **May 7th**, (2) **May 20th**, (3) **June 1st**, (4) **June 10th**, and (5) **June 20th**. Planting after June 20th is not recommended in WI. Two varieties within each MG from a 2.5 all the way down to a 00.5 were tested depending upon the location and planting date and are displayed in Table 1.

Table 1. Maturity Group's tested within each location and planting date.

Planting Date		Arlington	Hancock	Spooner
1 (May 7th)		2.5, 2.0, 1.5	2.5, 2.0, 1.5	1.5, 1.0, 0.5
2 (May 20th)		2.5, 2.0, 1.5	2.5, 2.0, 1.5	1.5, 1.0, 0.5
3 (June 1st)		2.0, 1.5, 1.0	2.0, 1.5, 1.0	1.0, 0.5, 0.0
4 (June 10th)		2.0, 1.5, 1.0	2.0, 1.5, 1.0	1.0, 0.5, 0.0
5 (June 20th)		1.5, 1.0, 0.5	1.5, 1.0, 0.5	0.5, 0.0, 00.5

Let's start with the easy and redundant part, get your soybeans in the ground ASAP to maximize yield. This is evident again in this trial, where Figure 1 shows the effect of planting date across all MG's (varieties) tested in 2014. If the soil is fit, soil temps are near 50 ˚F, and the forecast is favorable….. get the planter rolling!

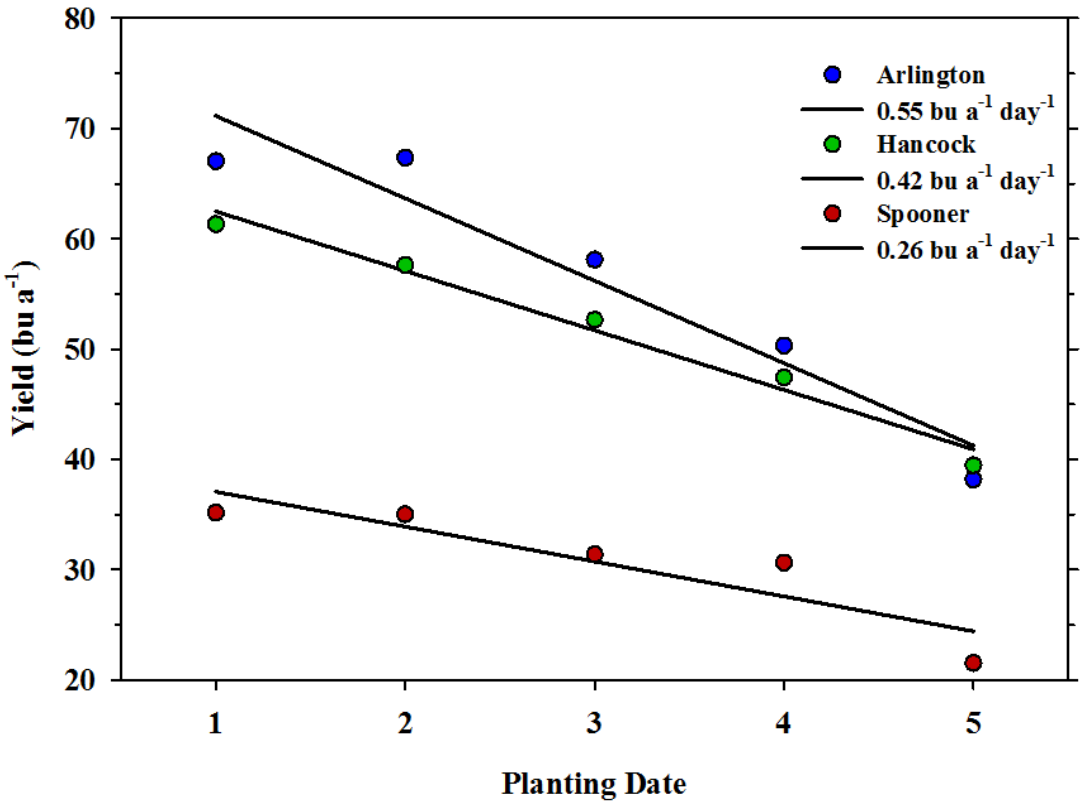

Figure 1. Dots represent the mean yield within each planting date for each location. The average yield loss per day for delaying planting past May 7th is presented in the legend.

However, the question still remains for many producers, should I use a longer maturity variety in early planting situations (very possible in 2015) and should I switch to an earlier maturing variety when planting is delayed?

Table 2. Effect of Maturity Group on Yield tested within each location and planting date.

Planting Date		Arlington	Hancock	Spooner
1 (May 7th)		NS	NS	NS
2 (May 20th)		NS	NS	NS
3 (May 30th)		NS	**	NS
4 (June 10th)		NS	NS	NS
5 (June 20th)		**	NS	NS

** MG had a significant effect on yield at the $P \leq 0.05$ level

Based upon the 2014 data, only 2 out of 15 location x planting date combinations displayed a significant effect of MG on yield (Table 2). So the moral of the story is that within a realistic MG range for your region and planting date, variety selection should be based heavily upon the varieties past local and regional performance, disease package, and etc. Variety selection heavily based upon the MG is not a silver bullet to frequently increasing yields.

However, there are always caveats…… Growers may consider trying a slightly longer maturing soybean on a portion of their acres because there is a "potential", but not guarantee, for higher yields with no additional dollars spent. Within planting date 1, there was no significant MG effect, but MG 2.5 did yield the highest numerically in Arlington and Hancock with no fall frost damage, while the same is true for MG 1.5 in Spooner. The longest MG tested within each planting date in our study numerically yielded the highest through June 10th (planting date 4).

On the back end of the planting season, the inverse was seen. Within planting date 5 at Arlington and Hancock, MG 1.5 did not mature before the first fall frost and was the lowest yielding. Therefore, growers may consider switching to an earlier maturing variety as planting is delayed into June. If switching to an earlier maturing variety, don't use a variety less than 0.5 MG earlier than a full season variety (2.5 in southern WI) in early June. However, if planting is delayed into mid to late June then a variety that is greater than or equal to a full MG earlier should be considered.

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Vegetable Crop Update 4/17/15

The 4th issue of the Vegetable Crop Update is now available. This issue contains late blight updates and reminders and updates on management of basil downy mildew. Click here to view this update.

2015 Wisconsin Soybean Yield Contest

Shawn Conley, Soybean and Wheat Extension Specialist

Wisconsin growers are producing soybeans more efficiently than they were 30 years ago, and we want to recognize the efforts and achievements of Wisconsin's top soybean producers.

- 2015 Wisconsin Soybean Yield Contest Brochure
- 2015 Wisconsin Soybean Yield Contest Rules
- 2015 Wisconsin Soybean Yield Contest Entry Form\

Scout your fields for weed seedlings this spring

Liz Bosak, Outreach Specialist, Department of Agronomy

The fields may look cold, wet, and dormant this week but weeds were germinating in some fields in Janesville and Arlington last week. On April 17 at Janesville, common lambsquarters, giant ragweed, and horseweed were emerging (Fig. 1A-D). At Arlington in a plowed area, velvetleaf was emerging (Fig. 2). If you are leasing new land this year or want to get a head start on weed management, then scouting for weeds at the seedling stage before tillage can be a good way to assess density, the number of weeds in a given area, and for which weed species will likely be an issue around planting time. The Weedometer, developed by University of Wisconsin, can predict when weed species will likely be emerging for your location at http://weedecology.wisc.edu/weedometer/. A guide to identifying the "Common Weed Seedlings of the North Central States" is available in pdf and print formats at Cooperative Extension's Learning Store, http://learningstore.uwex.edu/Common-Weed-Seedlings-of-the-North-Central-States-P161.aspx or on the WCWS Weed info page, http://wcws.cals.wisc.edu/weed-info/.

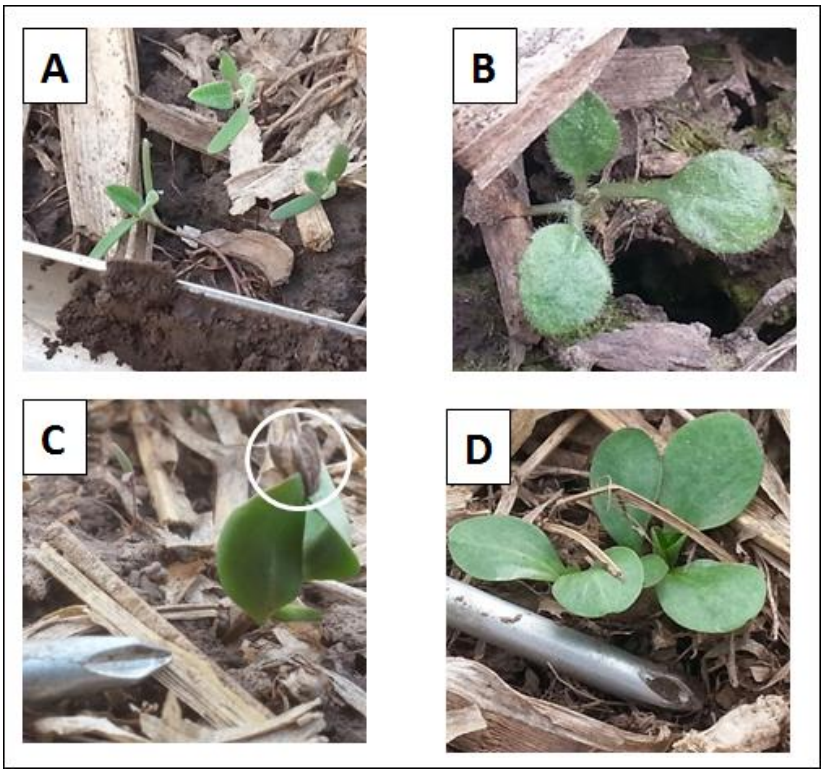

Figure 1. A) Common lambsquarters, Chenopodium album; a soil sampler, one inch diameter, is in the foreground B) Horseweed (marestail), Conyza canadensis; C) Giant ragweed, Ambrosia trifida, with seed capsule attached; D) Giant ragweed seedlings.

Figure 2. Velvetleaf, Abutilon theophrasti, seedling.

2015 Weed Emergence "on target" in Wisconsin

Mark Renz Extension Weed Scientist, Agronomy Department, University of Wisconsin-Madison

Knowledge of weed emergence is very important as it help in the selection and optimization of early season weed control. While typically weed emergence is consistent from year to year, the last two years have not followed this trend. During the 2012 growing season we saw weeds emerging 2-4 weeks earlier than typical. But in 2013, many species emerged 2-3 weeks late. So we can't assume that weed emergence will be the same every year.

So what is happening in 2015? I visited the Arlington Weed Garden last week to determine what has emerged and it appears most species are on target for typical germination/emergence in 2015. Of the 100+ species at the Arlington weed garden 40% of the common Wisconsin weeds have emerged. Of these 41 species, all of the biennial weeds have emerge, while 40% of the perennial and 29% of the annual weeds have broken through the soil surface.

Henbit

Winter annuals (shepherd's purse, fleabane, chickweed, downy brome, Field pennycress, prairie pepperweed, pineapple weed, henbit) are well developed and some are beginning to flower as you can see from this picture of henbit.

Most early emerging summer annuals have just germinated and are at the cotyledon to first true leaf stage (Russian thistle, knotweed, kochia, common ragweed, and giant ragweed). These are close to historical average emergence times for these species. For example common and giant ragweeds typically emerge on April 5th or 6th respectively and I viewed cotyledons present on my visit to the weed garden on 4/16 indicating that they emerged the prior week (see pictures below). Common lambsquarter is the only exception to the list, but I have noticed it emerged elsewhere.

Common Ragweed Seedling

Giant Ragweed

We are still waiting for pigweeds and foxtails to emerge, which typically around May 1st. With the current and projected weather for the next couple of weeks I expect their emergence to be on time as well.

A summary of average emergence along with the ability to create a graphic that estimates emergence and flowering time can be found at this link (weedometer):

http://weedecology.wisc.edu/weedometer/

This tool allows you to even change the location and estimate emergence at other locations throughout the state (and United States). A common rule of thumb however, is that what we observe at Arlington is occurs 2-4 weeks later in northern Wisconsin, and 1-2 weeks earlier in southern Wisconsin.

New Forecasting System for Fusarium Head Blight Now Available

Damon Smith, Extension Field Crops Pathologist, Department of Plant Pathology, University of Wisconsin-Madison

Fusarium head blight (FHB or scab) was a very damaging disease for many winter wheat growers in Wisconsin in 2014. This disease is caused by a fungus called *Fusarium graminearum* and infects the heads when the wheat flowers are open. Not only does the colonization of the fungus into the grain cause a reduction in kernel size and overall development, but also the fungus can produce a toxin called deoxynivalenol or vomitoxin. Vomitoxin can be extremely toxic to not only humans, but also livestock. For more information about the specific biology and management of FHB, CLICK HERE to download a fact sheet.

One of the primary methods of controlling FHB in-season is to spray fungicide. Much work has been done by university extension pathologists to determine the best time to spray fungicide to control the disease. It turns out that fungicides targeted at the anthesis (beginning flowering stage or Feekes 10.5.1) period do a good job of protecting the plants and controlling FHB. Additionally, we now know that fungicide applications up to 5 days after anthesis can also be effective in controlling FHB. Application of fungicide 7-10 days after anthesis will offer minimal control based on university research trials sponsored by the US Wheat and Barley Scab Initiative. For a list of products with efficacy on FHB, consult the 2015 Small Grains Fungicide Efficacy Table BY CLICKING HERE.

As you can tell, the timing of application of fungicide is critical for controlling FHB. You can apply the best product available, but if it goes on too early or too late, the application will be wasted. Furthermore, in some years, weather conditions will not be conducive for onset of FHB. This means that if it is really dry during the anthesis (flowering) period, infection by the FHB fungus will be low and little disease will develop. An application during dry weather at flowering will mostly be unnecessary. In order to assist growers and consultants on making fungicide application decisions to control FHB, an online FHB forecasting tool was developed. The tool can be found here: http://www.wheatscab.psu.edu.

Figure 2. FHB Forecasting System Control Panel

In previous years, the tool has tended to under-predict FHB infection events and under-represent the amount of FHB in Wisconsin. After more data was collected and new models were assembled, a new version of the FHB forecasting system has just been released to try to improve the accuracy of the FHB forecasting system. This new 2015 release is now active and functions automatically when you visit the link above. An additional change for 2015 in the winter wheat model is the addition of susceptibility levels for the winter wheat variety you are growing. Previously, the 'susceptibility' choice was not available for winter wheat. Consult your seed guide to determine the level of susceptibility for your variety in order to make this input. If you can't find this rating, then simply choose 'susceptible. After reviewing the model and the new forecasting system at our annual wheat disease workers meeting, I think that this system is a good improvement over the other forecasting system. I believe that this system has a model with better predictive accuracy. Of course, this does not mean that it can't fail, but should be a good tool for decision-making purposes. Remember, that your working knowledge and previous experiences are still good predictors of FHB. So even if the model is saying that risk is low and your gut says it is high, go with the 'boots-on-the-ground' observations and your gut.

The best time to consult the FHB forecasting system is prior to heading, and through the anthesis period. Begin consulting the model when wheat is in the boot to get a feel for the risk conditions that lead up to the flowering period in your area. Once heads have emerged and flowers are beginning to open, daily consultation of the model can assist in making that decision to spray during that critical Feekes 10.5.1 timing.

You should find the model fairly easy to use. After clicking on http://www.wheatscab.psu.edu you will be brought to the main page (Fig. 1). Enter your state (step 1) and then choose the wheat class (winter or spring) in step 2 (Fig 2). The model will update in real-time, giving you color coded risk levels. You can also choose a forecast (up to 72 hours ahead) in step 3 (Fig. 2). Additionally, your state wheat pathologist will have most likely written a commentary in the text box at the top of the page, once you have chosen your state. In Wisconsin, I try to update this weekly, especially during the critical time for controlling FHB. Remember to keep scouting and paying attention to the weather, in addition to consulting the FHB forecasting system. Here's to an FHB-free season!

Safe rates of seed placed starter fertilizer

Carrie Laboski, Professor and Extension Soil Fertility/Nutrient Management Specialist

Without fail every year after planting, questions start popping up about pop-up fertilizer. The questions always occur when there are emergence or germination issues. So before planting gets into full swing, let's think about seed placed starter. For the purpose of this article I will use seed placed, pop-up, and in-furrow interchangeably.

Why are fertilizer salts a problem?

Excessive concentrations of fertilizer salts near a germinating seed or seedling root causes injury. The injury is caused when the concentration of ions in the soil is greater than the concentration of ions within the plant cells. The high osmotic pressure created by the fertilizer salts causes water to move out of the plant cells and into the soil. As water moves out of the plant cells, the tissue dessicates and becomes blackened; hence the term fertilizer burn. The result is the eventual death of the plant tissue.

Some nitrogen fertilizers may cause more seedling and germination injury than expected based on their salt content alone if they liberate ammonia when applied to the soil. Free ammonia is toxic and can move freely through the plant cell wall (Havlin et al., 1999). Urea, UAN, ammonium thiosulfate and DAP can cause more damage from ammonia toxicity than MAP, ammonium sulfate, and ammonium nitrate (Havlin et al., 1999; Reid, 2006; Mortvedt, 2001). Moderate alkaline soil conditions, either in the bulk soil or caused by reaction of the fertilizer, will promote ammonia production.

Factors affecting fertilizer burn

Crops vary in their tolerance to salts. A list of common crops and their relative sensitivity to salts is given in Table 1. Reid (2006) suggests that no fertilizer be placed with the seed of super sweet hybrids of sweet corn, soybean, edible beans, and peas because of their sensitivity to salts.

Table 1. Relative sensitivity of common crops to fertilizer salts.*

Crop	Relative sensitivity
Wheat	Least sensitive†
Corn	
Forage legumes	↓
Soybean and Edible bean (dry or snap)	
Vegetables including sweet corn	Most sensitive

* Reproduced from Reid (2006).

† Least sensitive does not mean that the crop is not sensitive to salt.

Soil conditions are important for determining why injury may occur in one year and not another. Fertilizer salts diffuse away from the band in moist soils and becomes diluted, reducing the osmotic pressure. Little diffusion takes place in dry soils and the fertilizer remains concentrated with a high osmotic pressure presenting a greater risk to plant injury. Soils with low cation exchange capacity (CEC) (coarse-textured with low organic matter content) have a lesser ability to react with the fertilizer compared to high CEC soils (fine-textured) meaning that the concentration of fertilizer salts in the soil solution remains high (Reid, 2006). Thus, fertilizer burn is a bigger issue on sandy, low organic matter soils particularly in dry springs. Soil temperature also plays a role. Roots grow slowly in cold soils; thus, the root is exposed to the higher concentration of fertilizer for a longer period of time.

Concentration of fertilizer salts is another factor that determines whether or not fertilizer burn occurs. Broadcast fertilizer applications do not often injury seedlings because the fertilizer is dispersed through a large volume of soil. Banded starter fertilizers placed two inches to the side and two inches below the seed are more likely to cause injury than broadcast applications because banded applications are much more concentrated in a small area near the seed. However, at typical starter fertilizer application rates, fertilizer burn from banded starter fertilizer is unlikely. In-furrow (pop up or seed row) placed fertilizers are typically applied at low rates but their very close proximity to the seed means that they are more likely to cause injury than 2×2 banded applications because there is little opportunity for the root to grow out of the zone of concentrated fertilizer salts before it dies. In general to avoid stand loss from fertilizer injury, no more than 10 lb/a of N + K2O should be applied in-furrow regardless of soil texure. The most suitable fertilizers for in-furrow applications will have: 1) low salt index, 2) high water solubility, 3) no compounds that liberate NH_3, and 4) use potassium phosphate instead of KCl as the K source (Mortvedt, 2001).

Safe rates of in-furrow fertilizer

Salt index (SI) of a fertilizer is a measure of the salt concentration that fertilizer induces in the soil solution (Mortvedt, 2001). However, there are many steps in calculating salt index and it can be a bit confusing. South Dakota State University developed a Fertilizer Seed Decision Aid spreadsheet and web calculator based on field and greenhouse research. The Fertilizer Seed Decision Aid requires users to select the crop to be grown, fertilizer type, seed furrow width, row spacing, tolerated stand loss, soil texture and soil moisture at planting. The tool will then output a maximum rate of fertilizer to apply with the seed. The tool is really handy in assessing scenarios. For example, what if the soil was wetter or drier; what if I can accept more or less stand loss. Using the tool you will find that some relatively common practices may be a little riskier than you think. A good example of this is using ammonium thiosulfate in seed placed starters. You can access the Fertilizer Seed Decision Aid here:
http://www.sdstate.edu/ps/extension/soil-fert/fertapp.cfm

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