IPM Toolkit app updated to use local news

A new version of the IPM Toolkit app is available. You can now customize your choice of RSS feeds, Twitter account lists, and YouTube playlists that show up in the application. This will allow users in other states around the country to make more use of this app on their mobile devices.

The staff of the University of Wisconsin Integrated Pest Management (IPM) program developed the IPM Toolkit app to allow users to read IPM related news articles, view videos, download publications, and access pictures to aid in adapting IPM practices to their agricultural operations.

Check out this application for iPhone and iPad: http://itunes.apple.com/us/app/ipm-toolkit/id504685615?mt=8

Check out this application for Android: https://play.google.com/store/apps/details?id=ipcm.tool.kit

You can find out more about this app by following the link below:

http://ipcm.wisc.edu/apps/ipmtoolkit/

Broadcast Recording Available from National Cover Crops Conference

To meet some of today’s biggest challenges in agriculture, including rising food demand, a shrinking land base and climate change, farmers should be encouraged to adopt a holistic approach to enriching their most valuable resource – the soil – according to a panel of experts who helped open last week’s National Conference on Cover Crops and Soil Health.

“Cover crops to me are just the next natural step in trying to have a broader system, and I think the single biggest issue we have as farmers in this country is we don’t farm with a system in mind,” said panelist Howard G. Buffett, a philanthropist and Illinois farmer.

To learn more, watch a recording of opening sessions from the National Conference on Cover Crops and Soil Health, held Feb. 17 – 19 in Omaha, Neb. Joining the 300 farmers, scientists, and industry and government representatives who met in Omaha, approximately 6,000 others participated by gathering at more than 200 local soil health forums nationwide, where this recording was broadcasted live.

Also available online are presentations from breakout sessions and 10 short videos of innovative farmers describing their use of cover crops.

To read more follow the link below:

http://www.sare.org/Events/National-Conference-on-Cover-Crops-and-Soil-Health
The North Central Soybean Research Program (NCSRP) has recently funded an eight-state study to identify and prioritize future research needs on the use of cover crops in soybean production systems. Part of this project is to get a sense from soybean growers in Wisconsin, and from those that advise soybean growers in some capacity, if they are using cover crops before or after soybean.

Our goal is to get input from all soybean growers and consultants, not just ones currently using cover crops. The survey includes questions about drawbacks and challenges to cover crop use in Wisconsin. Answering “no” to the question, “Do you use cover crops?” is an important piece of information for us and for the NCSRP (and will dramatically shorten your time on the survey). For those that are using cover crops, we are very interested in which cover crop species are used, how they are planted, and what benefits you would like from cover crops. For the purpose of this survey, a cover crop refers to any crop intentionally planted between traditional crop production periods (May – October). This would not include any crop grown for the purpose of being harvested for feeding livestock. These survey results will be summarized and presented to the farmer-led NCSRP, along with a review of known research studies on cover crop impacts on soybean production. Your answers are anonymous.

Farmer Survey

To easily assess soybean grower use of cover crops, we have developed an 18-question survey. This survey can be completed online (https://www.surveymonkey.com/s/BGTMJ2S) and should not take more than 10 minutes to complete. There is also a hard copy of the survey available at www.ruarklab.soils.wisc.edu/research/cover-crops, although this will then need to be emailed or mailed after completion (mailing instructions are on the survey).

Crop consultant, agricultural professional, or service provider survey

The consultant survey can be found at (https://www.surveymonkey.com/s/5PDV788) and should not take more than 10 minutes to complete. There is also a hard copy of the survey available at www.ruarklab.soils.wisc.edu/research/cover-crops, although this will then need to be emailed or mailed after completion.

The survey is short and easy to complete. We hope you consider participating. Again, your answers are anonymous. If you’re interested in more information on cover crops please check out the Midwest Cover Crop Council website (www.mccc.msu.edu) which contains detailed information on nearly every crop species as well as current information on crop insurance issues as they pertain to cover crops. For Wisconsin specific information on cover crops, check out the cover crops page on the UW Soils Extension site (www.soils.wisc.edu/extension/covercrop).

Vegetable Crop Update 3/2/14

The first issue of the Vegetable Crop Update is now available. This issue contains information on upcoming cover crop webinars and early disease considerations for potato. Click here to view this update.

Recording Available from Corn Rootworm Management in the Transgenic Era

Eileen Cullen, Extension Entomologist

A free webinar was held on Feb. 20, 2014 to provide information on current rootworm management and information and recommendations on how to proceed in 2014 in light of developing western corn rootworm resistance to some Bt rootworm traits. This program was supported by a USDA-NIFA North Central IPM program grant.

The webinar was recorded and is available for viewing at: https://www.ncipmc.org/videos/index.cfm

Topics covered included:

Rootworm biology and behavior; Dr. Joe Spencer, IL Natural History Survey

Resistance evolution and IRM for rootworm; Dr. Aaron Gassmann, Iowa State University

Adult management options: Dr. Lance Meinke, University of Nebraska-Lincoln

Larval management options: Dr. Bob Wright, University of Nebraska-Lincoln

Decision tree for grower management options; Dr. Ken Ostlie, University of Minnesota

Follow us on
For additional information, the official agenda, and to register, visit the [Nitrogen Summit and Roundtable Series website](#).

**Friday, March 28, 2014**  
**A one-day Wisconsin Nitrogen Science Summit:**  
Exploring agricultural nitrogen and water quality connections - science, policy, and management

**TIME** 9:00 a.m. - 4:15 p.m.

**LOCATION**  
Microbial Sciences Building  
Ebling Symposium Center  
1550 Linden Drive, Madison, WI  
[Get Directions](#)

Click here to > REGISTER NOW

**ABOUT THE SUMMIT**  
As part of [Wisconsin's strategy](#) to better manage nutrients and water quality, University of Wisconsin-Madison, College of Agricultural and Life Sciences (CALS) is hosting a Nitrogen Science Summit on March 28, 2014.

The summit will discuss the state of knowledge regarding nitrogen presence and pathways in Wisconsin's environment - soil, surface water, groundwater, air - what we know, what we don’t know, and related uncertainties.

We expect participants representing many Wisconsin stakeholders across agricultural sectors, agencies, nongovernmental organizations, and academics.

**AFTER THE SUMMIT**  
The summit will kick off a year-long series of focused round-table discussions about nitrogen.

**PARTNERSHIPS**  
UW CALS will host the summit and series in partnership with Wisconsin's conservation agencies (including UW-Extension, DNR, DATCP, NRCS, USDA-ARS) and others in the public, private, and non-profit sectors.

**QUESTIONS?**  
Martha Martin  
mlmartin3@wisc.edu (608) 262-0020
Introduction

Soybean planting date trends have steadily shifted earlier within the Northern Corn Belt while inclement weather, insect pressure, and disease pressure associated with spring planting can require replanting some years (USDA-NASS, 2011). Furthermore, recent studies have reported similar yields among reduced plant stands due to the soybean plants compensatory ability (Carpenter and Board, 1997) and diminished yield potential of replanted or essentially later planted soybeans (Conley et al., 2012; De Bruin and Pedersen, 2008). Ultimately, producers would like to know the potential yield gain or loss from replanting sub-optimal plant stands to help determine if replanting is economical. Therefore the objectives of this study were to:

- determine the threshold for replanting soybean stands.
- evaluate replanting options.
- quantify the effect of seed treatments and planting date on replant decisions.

This study was conducted in 2012 and 2013 at the Arlington Agricultural Research Station, Arlington, WI. Twelve different replant scenarios were planted in 15 inch rows during early May, late May, and mid-June. The replanted portions of the plots were interseeded between the rows of the initial soybean stand. ApronMaxx RFC and CruiserMaxx (Syngenta Crop Protection) seed treatments were used to compare a fungicide only seed treatment with one that also contains an insecticide.
Determine the Initial Plant Stand

The first step in making an informed replant decision is determining the initial plant stand. Soybean stands can be deceiving to the eye sometimes, especially in narrow rows (<15 inch), where stands can be greatly underestimated. Therefore, using the hula hoop method or counting the number of plants in a row is needed to accurately determine the plant stand. If severe weather causes stand reduction and/or plant injury, stand counts should be performed 3-5 days after damage has occurred to give the plants time to recover. Only live plants that are expected to survive should be counted (Table 1).

<table>
<thead>
<tr>
<th>Plant Condition</th>
<th>Will the plant survive?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant cut off below the cotyledons</td>
<td>No</td>
</tr>
<tr>
<td>Plant missing only one cotyledon</td>
<td>Yes</td>
</tr>
<tr>
<td>Plant missing both cotyledons but growing point intact</td>
<td>Yes</td>
</tr>
<tr>
<td>Plant cut off above unifoliate leaves</td>
<td>Yes</td>
</tr>
<tr>
<td>Plant lightly bruised on the stem</td>
<td>Yes</td>
</tr>
<tr>
<td>Plant heavily bruised and folded over</td>
<td>No</td>
</tr>
</tbody>
</table>

Counting Plants in a Row

When determining the plant stand with this method, count the number of plants in a length of row based upon your row spacing (Table 2). Do this at least five times in different areas of the field and calculate the average, then multiply that number by 1,000 to get the number of plants per acre (plant stand).

<table>
<thead>
<tr>
<th>Row Width (inches)</th>
<th>Length of Row*</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>17.4 feet</td>
</tr>
<tr>
<td>20</td>
<td>26.2 feet</td>
</tr>
<tr>
<td>15</td>
<td>34.8 feet</td>
</tr>
<tr>
<td>10</td>
<td>52.3 feet</td>
</tr>
<tr>
<td>7.5</td>
<td>69.7 feet</td>
</tr>
</tbody>
</table>

*Length of Row = \((43,560 \div \text{row width(ft)}) \div 1000\)

Hula Hoop Method

When determining the plant stand with this method, randomly toss any round hoop with a known diameter on the ground and count the number of plants within the hoop. Do this at least five times in different areas of the field and calculate the average, then multiply that number by the appropriate multiplier (Table 3) to get the number of plants per acre (plant stand).

<table>
<thead>
<tr>
<th>Hoop Diameter (inches)</th>
<th>Multiplier*</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>24,662</td>
</tr>
<tr>
<td>21</td>
<td>18,119</td>
</tr>
<tr>
<td>24</td>
<td>13,872</td>
</tr>
<tr>
<td>27</td>
<td>10,961</td>
</tr>
<tr>
<td>30</td>
<td>8,878</td>
</tr>
<tr>
<td>33</td>
<td>7,337</td>
</tr>
<tr>
<td>36</td>
<td>6,165</td>
</tr>
</tbody>
</table>

*Multiplier = \(43,560 \div ((\text{hoop radius}^2 \times 3.14) \div 144)\)
Replant Threshold

Our study showed that the highest yields were achieved with initial plant stands >100,000 plants/a (Figure 1). This is consistent with Lee et al. (2008), who stated soybeans in Kentucky require plant stands above 100,000 plants/a to achieve 95% of maximum yield. This is further demonstrated by the initial seeding rates of 40000, 60000, and 80000 seeds/a with no replanting, which produced final plants stands well below 100,000 plants/a and yielded 10, 5, and 4 bu/a less than the maximum yield, respectively (Figure 1). However, when these same plant stands were filled in and the final plant stands were subsequently increased above 100,000 plants/a; significant yield increases of 7, 2, and 2.5 bu/a were attained, respectively (Figure 1). Replanting initial soybean stands <100,000 plants/a significantly increased yield, but not to levels attained by initial plant stands >100,000 plants/a, where replant is not beneficial. Therefore, the threshold for soybean replanting is 100,000 plants/a.

Replanting Options

When below threshold soybean stands arise (<100,000 plants/a), producers are faced with the decision to fill in the initial stand or perform a tillage operation and completely replant the entire stand. Our study found that a tillage operation limited yield potential by essentially delaying planting and reducing cumulative light interception of the entire stand compared to only a portion of the stand when the fill in method was used (Gaspar and Conley, 2014). In Figure 1, we see that when the initial plant stand was reduced to zero (by tillage), replanting with up to 220,000 seeds/a only significantly increased yield over a final plant stand of 37,000 plants/a. However, when this plant stand was filled in with only 100,000 seeds/a, its yield was the same or higher than replanting the entire stand with 220000, 180000, and 140000 seeds/a (Figure 1). Furthermore, final plant stands >59,000 plants/a produced similar or higher yields compared to using tillage and replanting with 220,000 seeds/a (Figure 1). Therefore, filling in soybean stands below the replant threshold (100,000 plants/a) is the best method of replanting and replant seeding rates should be high enough to increase the final plant stand over 100,000 plants/a. Figure 2 depicts a stand with 37,000 plants/a being filled in with 100,000 seeds/a.
Seed Treatment and Planting Date Effects on the Replant Decision

We observed no effect of seed treatment use on replant decisions and therefore should not be a factor considered. However, seed treatment use (especially insecticide/fungicide treatments) may help avoid replanting because it is an effective management practice for increasing initial plant stands by 20% on average (Gaspar et al., 2014).

Our study indicated a large yield decline as planting was delayed past the first week in May (Figure 3). This yield decline is most likely due to decreased light interception of later planted or replanted soybeans. The earliest planting date yielded 73 bu/a (Figure 3). We observed a 0.25 bu/a/day yield decline between the early May and late May planting dates, which then doubled to 0.5 bu/a/day between the late May and mid-June planting dates. The average yield decline through the whole planting season was 0.32 bu/a/day. However, the replant decision was not affected by planting date and therefore the replant threshold (100,000 plants/a), method (fill-in), and seeding rates (>100,000 plants/a) are appropriate until June 20th in southern WI. Replanting past this date greatly increases the risk of fall frost damage (Conley and Gaska, 2013).

Conclusion & Recommendations

The first step in deciding if replanting is required is to determine the initial plant stand. Our study demonstrated that replanting soybean stands below the threshold (100,000 plants/a) by filling in the existing stand, increased yields regardless of the date (May-June 20th) and seed treatment use. Below threshold plant stands should be filled in with enough seed to bring the final stand above 100,000 plants/a. Using tillage and replanting the entire stand greatly limited yield potential, even at replant seeding rates of 220,000 seeds/a. This is due to the entire plant stand being replanted or essentially planted later, which reduces yields by 0.32 bu/a/day on average. These replant recommendations are applicable through June 20th in southern WI, where replanting after this date is not advised. Traditionally, the notion of adequate weed control has led producers to desire higher plant stands to quickly shade out competing weeds. However, pre-herbicide use and modern post herbicide technology has essentially eliminated this concern. This study only evaluated soybean replanting in terms of yield and did not take into account the economics of a replant decision, which include additional seed, fuel, labor, and machinery costs; along with potential crop insurance replant payments. Producers should consult their crop insurance agent before making any replant decisions. Ultimately, the producer’s efforts should be placed on using this data in conjunction with their own finances to determine if replanting will increase economic return.

References


