Wisconsin Crop Manager

Volume 25 Number 11 - - University of Wisconsin Crop Manager - - June 21, 2018

Contents

Assessing Flood Damage to Soybean

Shawn Conley, State Soybean and Wheat Specialist
University of Wisconsin, Madison

Severe flooding over the weekend has many low-lying soybean fields underwater. As the water dissipates yield potential and replant questions will arise. Flooding can be divided into either water-logging, where only the roots are flooded, or complete submergence where the entire plants are under water (VanToai et al., 2001). Water-logging is more common than complete submergence and is also less damaging. Soybeans can generally survive for 48 to 96 hours when completely submersed. The actual time frame depends on air temperature, humidity, cloud cover, soil moisture conditions prior to flooding, and rate of soil drainage. Soybeans will survive longer when flooded under cool and cloudy conditions. Higher temperatures and sunshine will speed up plant respiration which depletes oxygen and increases carbon dioxide levels. If the soil was already saturated prior to flooding, soybean death will occur more quickly as slow soil drainage after flooding will prevent gas exchange between the rhizosphere and the air above the soil surface. Soybeans often do not fully recover from flooding injury.

Crop injury from water logging is difficult to assess. Water-logging can reduce soybean yield 17 to 43% at the vegetative growth stage and 50 to 56% at the reproductive stage (Oosterhuis et al., 1990). Yield losses are the result of reduced root growth, shoot growth, nodulation, nitrogen fixation, photosynthesis, biomass accumulation, stomatal conductance, and plant death due to diseases and physiological stress (Oosterhuis et al., 1990; VanToai et al., 1994 and 2003). A significant amount of genetic variability for flooding tolerance among soybean varieties occurs in maturity groups II and III (VanToai et al., 1994) and likely exists for maturity group I soybeans as well.

Increased disease incidence in the surviving plants may also occur and limit yield potential. The main culprit will likely be phythophthora given the warm wet weather; however phythium, rhizoctonia, or fusarium may also occur. Differential response among varieties will be tied to the sources of genetic resistance to these diseases.

Once we can get back into the fields the decision to replant will be based on the yield potential of the current stand relative to the cost and yield potential of the replanted soybean field (Table 1). Before any decision to tear up a field is made make sure you contact your crop insurance agent to discuss coverage and you have the replant seed on your farm or at least en route. Also remember to check herbicide labels for plant back restrictions if you are planning to plant soybean into a flooded corn field.

Table 1. Expected relative soybean yield at four replanting dates compared to predicted yields for a range of plant populations resulting from an optimum planting date of May 1-20 for full season maturity or short season maturity varieties.

Since full season maturity group soybeans are unrealistic for planting this late plant soybean cultivars 0.5 MG earlier than "normal". The average yield potential for soybean planted in late June in southern WI is in the 30 to 35 bu yield range (Figure 1). For yield potential and harvestability, (a combine may not be able to pick up the lower pods) a grower should not go to an extreme early MG for their geographic area.

To maximize yield potential in late planted soybean, a

Early plant population	Replanting date									
	May 1-20		June1		June 10		June 20		July 1	
Ppa x 1000	----------% of maximum yield----------									
200	**100**[1]	86	**89**	90	**75**	75	**68**	67	**61**	60
180	**98**	85	**88**	87	**75**	72	**66**	64	**63**	60
160	**97**	84	**87**	84	**70**	70	**64**	61	**63**	58
140	**95**	83	**85**	81	**67**	67	**62**	57	**62**	56
120	**93**	81	**82**	78	**65**	65	**59**	53	**60**	52
100	**91**	80	**80**	76	**63**	63	**57**	49	**56**	47
80	**88**	79	**77**	73	**61**	61	**54**	44	**51**	40
60	**86**	78	**73**	70	**60**	60	**51**	39	**44**	33
40	**83**	77	**69**	67	**59**	59	**47**	34	**35**	25

[1]Yield potential of full season varieties are in bold while yield potential of earlier maturity group soybeans are given in normal text.

minimum of 180,000 plants per acre is required in narrow row system (<20 inches) as yield potential in rowed beans would be significantly reduced due to decreased canopy development. To achieve 180,000 plants per acre a grower may have to seed as many as 225,000 seeds per acre.

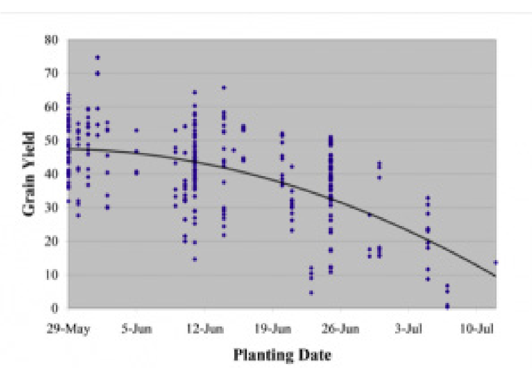

Figure 1. Figure 1. Planting date effect on grain yield of early to mid maturity group soybeans (0.4 to 1.8 RM) in southern WI (Data from early 1990s planting date study).

Literature Cited:

Borges, R. (2004). Soybean management and excessive soil moisture.

Boru, G., T. Vantoai, J. Alves, D. Hua, and M. Knee. 2003. Responses of Soybean to Oxygen Deficiency and Elevated Root-zone Carbon Dioxide Concentration. Annals of Botany, 91: 447-453.

Neave, S. 2002. Flooded Fields and Soybean Survival. MCCN80. www.plpa.agri.umn.edu/extension.

Oosterhuis, D.M. H.D. Scott, R.E. Hampton and S.D. Wullschleger 1990. Physiological response of two soybean [Glycine max, (L.) Merr.] cultivars to short term flooding. Env. Exp. Bot. 30:85-92.

Shannon, G., W. E. Stevens, W. J. Wiebold, R. L. McGraw, D. A. Sleper, and H.T. Nguyen, 2005. Breeding Soybeans for Improved Tolerance to Flooding. Proceedings ASTA Meetings.

VanToai, T.T., J.E. Beuerlien, A.F. Schmithenner, and S.K. St. Martin, 1994. Genetic variability for flooding tolerance in soybeans. Crop Sci. 34:1112-1115.

VanToai, T.T., S. K. St. Martin, K. Chase, G. Boru, V. Schnipke, A. F. Schmitthenner, and K. G. Lark. (2001) Identification of a QTL associated with tolerance of soybean to soil water-logging. Crop Sci. 41,1247-1252.

VanToai, T. Y. Yang, P. Ling, G. Boru, M. Karica, V. Roberts, D. Hua, B. Bishop.(2003) Monitoring soybean tolerance to flooding stress by image processing technique. In T.T. VanToai, et al. (ed) Digital Imaging and Spectral Techniques: Applications to Precision Agriculture and Crop Physiology. ASA Special Publication No 66. The American Society of Agronomy. Madison, WI. Pp 43-51.

To read this article on the Cool Bean blog, click here.

First Generation European Corn Borer

Bryan Jensen, Dept. of Entomology and IPM Program

It is no secret that European corn borer populations have been extremely low for several years. However, what does catch my attention is that I still get a few calls each year regarding field populations that (might) require management. Since there has been greater interest in growing conventional corn, a quick review might be worthwhile as we enter the best ECB treatment timing in southwest Wisconsin.

Depending on your location in Wisconsin we usually have 2 generations/year. First generation adults are usually attracted to the earliest planted corn so concentrate your scouting efforts there. Especially if corn plants are greater than 18" extended leaf height. Corn shorter than

18 inches has a higher concentration of DIMBOA which deters larvae from feeding resulting in significant mortality. The best treatment period for first generation is usually short (between 800-1100 degree days) compared to second generation treatment period which is much longer and more difficult to manage economically.

Examine 10 consecutive plants in 10 areas of each field and keep tract of the number of plants showing leaf feeding (shot-holing). Pull the whorl leaves from two damaged plants/set and unroll the leaves to count the number of larvae/damaged plant. Calculate % damaged plants and determining the average number of larvae/plant. The worksheet (below) is taken from A3646, Pest Management in Wisconsin Field Crops (p 58). It allows you to develop a field specific threshold that is based on % damage, # larvae/plant, control costs, expected yield and selling price.

For example, a loss potential of $17.50 would be expected for a field with a rather high population of 50% damaged plants, 1 larvae/damaged plant, a yield potential of 200 Bu/A and a selling price of $3.50/bu. Compare that $ loss to control costs in your area. Remember that insecticides are only about 80% effective.

After hatch, first generation larvae migrate to the whorl and feed on leaves and mid-ribs prior to boring into the stalk. Symptoms of whorl feeding include small, irregular holes, often call shot-holing. As larvae mature, they may feed across the rolled up leaf creating a transverse pattern of holes prior to boring into the stalk. Once larvae burrow into the stalk it is too late to treat. There isn't a lot of time to make a decision. The whole process from egg hatch to stalk tunneling is weather dependent. Ten days would be a good ballpark guess.

1st Generation European Corn Borer Management Worksheet

☐ % of 100 plants infested x ☐ average # of borers/plant[A] = ☐ average borers/plant

☐ average borers/plant x 5% yield loss per borer = ☐ % yield loss

☐ % yield loss x ☐ expected yield (bu/A) = ☐ bu/A loss

☐ bu/A loss x ☐ $ expected selling price/bu = ☐ $ loss/A

☐ $ loss/A x ☐ % control[B] = ☐ $ preventable loss/A

☐ $ preventable loss/A - ☐ $ cost of control/A = ☐ $ gain (+) or loss (-) per acre if treatment is applied

Armyworms

Bryan Jensen, Dept. of Entomology and IPM Program

Armyworms might be something you want to keep an eye open for during the next few weeks. No major concerns have been reported. This is just a heads up.

First generation armyworm larvae are hard to predict in terms of timing, location and severity. However, it is that

time of the year when I would scout fields which have the greatest likely hood of damage. In wheat (and other small grains) it is especially hard to anticipate. Areas with dense cover and perhaps areas with lodging might be worth concentrating scouting efforts on. Armyworm feed on foliage but can also clip heads. Treatment is suggested if you find an average of 3 armyworms per square foot in small grains.

In, corn I would suggest concentrating scouting efforts on fields that are no-tilled into alfalfa, had a small grain cover crop or early season grass weeds. In corn, treatment can be suggested when 25% of the plants have two or more larvae/plant or when 75% of the plants have one larvae/plant. Treatment would not be suggested if larvae are greater than 1 ¼ inch in length. Those larvae will be pupating soon and very little additional defoliation would be expected. Certainly not enough to pay for an insecticide application.

Armyworm larvae

OGRAIN, Field Day Agenda, Janesville, July 12

Small grains, modest gains:

A pragmatic approach to profitability and sustainability

This field day will highlight the diversity and innovations at the Hughes Farms in Janesville, WI. Farming over 5000 acres in a parallel operation consisting of both conventional and organic practices, the Hughes have succeeded in developing diverse rotations and markets. This field day, in partnership with Practical Farmers of Iowa, MOSES, and the Organic Seed Alliance, will discuss and showcase cover crops for green manures, weed control, soil erosion reduction and water quality improvements; tips for trialing varieties for performance under organic management; and basics of transitioning to organic certification.

See attachment at the end of PDF for more information.

Wisconsin Fruit News- Volume 3, Issue 5

Janet van Zoeren and Christelle Guédot, UW-Extension

https://go.wisc.edu/5orlb7

This week in the Wisconsin Fruit Newsletter you can read about:

- A new invasive fly – the African fig fly
- Insect Diagnostic Lab update
- Plant Disease Diagnostic Clinic update
- The African fig fly in Wisconsin in 2017
- Cranberry plant and pest degree-days: June 13, 2018
- Crown gall of grapes
- Recognizing synthetic auxin herbicide injury in grape vines
- Grape variety developmental stages: June 14, 2018
- Codling moth management

Wisconsin UWEX Vegetable Crop Update Issue 11

Amanda Gevens, Associate Professor & Extension Specialist, Potato & Vegetable Pathology, UW-Madison Plant Pathology Department

Vegetable Crop Updates Newsletter #11

- Disease forecast info for late blight and early blight
- Late blight on tomato confirmed in Onondaga Co. NY
- Cucurbit Downy mildew national update
- Horticultural updates

Wisconsin Pest Bulletin, Issue No. 7, June 14

Krista Hamilton, Entomologist, Bureau of Plant Industry/ Division of Agricultural Resource Management, Wisconsin Department of Agriculture, Trade and Consumer Protection

Volume 63 Issue No. 7 of the Wisconsin Pest Bulletin is now available at:

https://datcpservices.wisconsin.gov/pb/pdf/06-14-18.pdf

INSIDE THIS ISSUE

LOOKING AHEAD: New lily leaf beetle sightings in Portage County

FORAGES & GRAINS: Alfalfa weevil larval damage period subsiding

CORN: Corn rootworm peak egg hatch expected by late June

SOYBEAN: Rose chafer beetle causing light soybean defoliation

FRUITS: Spotted wing drosophila flies captured by UW in Dane Co.

VEGETABLES: Squash vine borer moth emergence starting

NURSERY & FOREST: Maple tree pest updates from recent inspections

DEGREE DAYS: Growing degree day accumulations as of June 13, 2018

UW/UWEX Plant Disease Diagnostic Clinic (PDDC) Update June 15

Brian Hudelson, Sue Lueloff, John Lake and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from June 9, 2018 through June 15, 2018.

The 6/15/18 PDDC Wisconsin Disease Almanac (i.e., weekly disease summary) is now available at:

https://pddc.wisc.edu/wp-content/uploads/sites/39/2018/06/FullTable061518.pdf

Follow us