

Plant & Soil Sciences

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Extension Newsletter



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Will water-logged soils hurt my summer crops?

By Chad Godsey

In some parts of the state we are experiencing waterlogged conditions in many areas of the state. Waterlogging of a field for several days reduces the crop growth rate and can potentially reduce yield. Detrimental effects from the lack of oxygen on plant growth can be attributed to three primary things 1) lack of oxygen and a resulting decrease in root growth, 2) nitrogen deficiency due to denitrification or leaching, and/or 3) toxic compounds that build up in the plant. Waterlogged conditions reduce the crop growth rate by replacing the air in the soil with water, depriving the root system of oxygen.

Respiration is the physiological plant process most sensitive to flooding. Respiration is a necessary process that the plant uses to provide energy and building blocks for growth. In waterlogged soils oxygen diffuses more slowly through water than air, the roots become deprived of oxygen and are unable to maintain normal respiration. Waterlogged plants may have the following characteristics: chlorotic, yellow appearance; reduced growth rates; reduced photosynthesis and respiration; reduced nutrient uptake; and altered plant hormone levels.

Younger plants are more susceptible to injury compared to older plants because of fewer roots. Older plants will often times have roots that extend below the saturated zone where more oxygen is available. Soybean and sorghum plants that have just emerged in the last couple weeks will most likely show the most symptoms because of limited root growth. If soils stay waterlogged for more than 48 hours it would not

be surprising to see some symptoms appear.

Even if flooding doesn't kill plants, it may have a long-term negative impact on crop performance. Excess moisture during the early vegetative stages reduces root development. As a result, plants may be subject to greater injury later during a dry summer because root systems are not sufficiently developed to reach available subsoil water.



Soybean plants growing under waterlogged conditions. Notice the reduced growth of the plants where water is standing.

A considerable amount of oxygen is required in the soil for mineralization of nutrient elements from organic matter by microbes. Oxygen deficiencies reduce microbe activity, decreasing the rate at which ammonium and nitrate are supplied to plants resulting in nitrogen deficiency in waterlogged soils. Flooding can also result in losses of nitrogen through denitrification and leaching. This is a year where producers will likely see a huge benefit of the handheld sensor technology to predict side-dress N application rates in corn. We no doubt have the potential to lose nitrogen to leaching and denitrification.

In Oklahoma, yield reduction is seldom observed from waterlogged

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Hay production practices simply stated

By Daren Redfearn

Even though winter feeding has the greatest costs associated with keeping livestock, some hay feeding is inevitable even for the most cost-efficient livestock producers. Several hay management options are available that can reduce the associated costs of extended hay feeding during the winter.

In a hay production system, the only two management practices that under complete control of the producer are fertility which directly influences forage yield and plant maturity at harvest which directly influences forage nutritive value. Forage yield is a function of the soil type, available moisture, forage type, and fertilizer, primarily nitrogen fertilizer. A common misconception is that fertilizer greatly improves forage nutritive value. With the exception of crude protein, most nutritive value increases are small and amount to less than 2 percentage points. Any advantages gained in increased nutritive value will disappear if the forage is not harvested in a timely fashion.

Plant maturity is the primary factor determining forage quality or nutritive value. An immature plant has more nutritive value and should have higher quality than a mature plant. In general, the highest quality forage is harvested when the forage plant is in a vegetative stage of growth. As the seedheads begin to appear, forage quality begins to rapidly decline. Forage quality is an important factor because hay that tests greater than 10% crude protein will provide the protein requirement of a lactating beef cow if fed free choice. If crude protein is less than 10%, the same cow will require additional protein supplementation to meet her nutritional needs. For comparison, a dry cow requires 8% crude protein.

Water-logged (cont.)

conditions because we usually dry out soon after waterlogged conditions begin. The effect on the crop from waterlogged conditions depends a lot on what the remainder of the growing season holds. Will it be hot and dry or remain wet and cool? If we get a few drying days soybean, corn, and sorghum plants should recover quickly and begin normal growth.

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In general, high quality bermudagrass hay should be harvested about every 28 to 30 days. The crude protein concentration of fertilized bermudagrass harvested after 28 days of growth usually exceeds 10% crude protein. However, if it is harvested in July after 60 days growth, it can be as low as 5 or 6%.

Summer annual forages such as forage sorghums, sudangrass or millets, should be harvested in the boot stage, which occurs just as the seedheads begin to emerge. Nutritive value in sorghums and sudangrasses declines rapidly. Crude protein of sorghum-type forages can decline ½ percentage point per day following emergence of the seedheads. It is possible for sorghum type forages to drop from 15% crude protein at boot stage to less than 6% percent when fully headed. This can occur in only two weeks time.

Simply stated, low quality forage generally has similar production costs to high quality forage; overly mature forage is still low quality forage even if it has been fertilized; grow or purchase the highest quality hay possible.

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To receive an electronic copy of the OSU PASS Extension Newsletter, contact Janelle Malone at janelle.malone@okstate.edu. Please include "PASS Newsletter Subscription" and your name in the subject line.

PaSS Extension Specialists with Twitter

By Joe Armstrong and Brian Arnall

Two PaSS Extension Specialists recently entered the ranks of agricultural “twitterers” that are using the website www.Twitter.com to keep producers, consultants, extension educators, and others up to date on current happenings in Oklahoma agriculture. Joe Armstrong, Extension Weeds Specialist, and Brian Arnall, Precision Nutrient Management Specialist, have initiated Twitter accounts. Joe’s OSUWeedSci “tweets,” or updates on Twitter, will focus on reporting results and observations from his trials and field experiences. Brian’s OSU_NPK tweets will be pointed towards fertility updates and reports. Both will give updated reports as they travel the state for their extension duties, letting followers know about the current field conditions and any situations that may develop. Twitter updates can also be used to direct readers to links with important articles, fact sheets, or other information regarding weed management, soil fertility, or other aspects of crop production. Additionally, Joe and Brian will also be using “TwitPics,” which allows them to post pictures along with their tweets (see below for an example tweet and TwitPic update). This is a new endeavor for PaSS Extension and if their experience is positive, other Extension Specialists may be soon to follow.

To follow Joe and Brian and receive

their Twitter updates, you must be a logged into Twitter. Accounts are free, east to sign up for, and will not fill your email box with



ALS-resis Italian ryegrass is a very real problem. For now, it can be controlled with Axial XL or Hoelon, both from the ACCCase inhibitor mode of action.

unnecessary messages. To sign up for an account, visit www.Twitter.com and choose a log-in name and password. Once you are logged in, simply search for OSUWeedSci and OSU_NPK and click the follow icon to get automatic updates whenever new tweets are posted. There is also a link on the www.NPK.okstate.edu webpage to follow Brian. Please feel free to leave any feedback or post your own questions and observations on the OSUWeedSci and OSU_NPK pages.

Joe Armstrong can be reached at joe.armstrong@okstate.edu, and Brian Arnall can be reached at b.arnall@okstate.edu.

Home Profile Find People Settings Help Sign out

OSUWeedSci

Name OSU Weed Science
Location Stillwater, OK
Web <http://www.weedsc...>
Bio Oklahoma State University
Extension Weed Science

25 following 13 followers 1 listed

Tweets 15

Favorites

Actions
block OSUWeedSci
report for spam

Following

Now is the time to scout your wheat to determine which weeds you will be fighting next year. Canola is a great solution to clean up fields.

8:53 AM May 19th via web

Oklahoma Land Judging

By Jason Warren

Oklahoma has a long history of providing opportunities for 4-H and FFA students to learn how to utilize and conserve our soil and land resources. For 59 years Oklahoma has hosted the National Land and Range Contests the first week of May. It has been my pleasure to help the Oklahoma Association of Conservation Districts with the Land and Home site evaluation contests during this 3 day event. The Land judging contest teaches students how soil and landscape characteristics are used to determine the lands capability classification and the management practices needed to conserve the soil resource. The Home site evaluation contest teaches students about how soil properties and landscape position can impact a sites suitability for home construction.

These contests are highly competitive and combined there were more than 670 students from 33 States competing. As always, Oklahoma was strongly represented in both contests. Oklahoma had 4 teams enter the Land judging contest, 3 of which

placed in the top 10 out of 97 teams. The Roland FFA placed 2nd, the Porter FFA placed 7th and the Guthrie FFA placed 8th. More impressive still was the effort put forth by Jacob Nall from the Roland FFA who achieved a perfect score of 300 in the Land contest. This is a great achievement, making him very much deserving of the National Championship.

Oklahoma had 3 teams entered in the Home site evaluation contest, 2 of which placed in the top 5 of 49 teams. The Guthrie FFA placing 3rd and the Sequoyah FFA placing 5th deserve congratulations for their success.

Land judging is a great opportunity for students to learn about our land and soil resources. There are a number of local and regional contests held throughout the State with the season ending every spring in Stillwater at the State contest. To learn more about Land judging in Oklahoma go to www.landjudging.com.

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Upcoming Events

OSU Plant Science Academy

*June 6-8, 2010 OSU Agronomy Farm
Stillwater, Okla.
(Register by April 1.)*

OSU Winter Canola Conference

*Date TBD Hoover Building
Enid, Okla.
(More details to follow.)*

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