Flooding or drought?

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Abstract
Currently, we have the whole spectra of growing conditions in Iowa. Northern and central Iowa have received excessive amounts of rainfall during the past 14 days, whereas southern Iowa (especially southwestern Iowa) is getting really dry. Mother Nature’s actions are beyond our control, but a little bit too much rainfall is better than no rainfall at all.

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Flooding or drought?

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Soybean plants are still small in many fields because of the late planting and the cool and wet conditions in May and June. Currently, more than 80 percent of the soybean fields are flowering but many haven't formed a complete canopy yet. The good news is that excessive soil moisture in many parts of Iowa, and hopefully warmer temperatures, will promote rapid growth and a complete canopy before pod set. Complete canopy closure for late-plated soybean in 30-inch rows will probably not happen this year because soybean planted in mid-June is now in the V2-V3 stage.

In areas that are dry, it is important to remember that soybean yield is largely made up during pod set and seed-filling (end of July and during most of August). Despite this year's growing conditions, an acceptable yield can still be obtained.

In many areas, however, soil moisture is excessive and with standing water in fields. Hopefully, this water will dry up quickly, barring no more excessive rainfall. Those who haven't finished applying herbicides are in a dilemma because the weeds and the crop are growing rapidly, but it is recommended to wait until the soil is dry before taking heavy machinery into the field. Soil compaction contributes to reduced root growth and may reduce yield significantly.

There is some speculation on how soybean responds to waterlogging or poor aeration associated with floods. Standing water in low-lying fields can result in significant soybean yield reduction and can last many days due to lack of soil permeability or surface drainage. It is generally recognized that soybean prefer adequate soil oxygen for maximum productivity and research from Minnesota shows that flooding for 6 days or more may result in significant yield loss or losses of the entire crop. However, temperatures during flooding determine the recovery rate of soybean. Soybean plants may only survive a few days with current high temperatures because higher temperatures cause the plants to deplete stored energy more quickly. Research from Ohio showed that plants in flooded fields are injured from a buildup of carbon dioxide, which is up to 50 times higher in flooded soils than in nonflooded soils, and concluded that plants are injured from the buildup of carbon dioxide and not from lack of oxygen. Cool, cloudy days and cool, clear nights increase the survival of a submerged soybean crop.

Finally, flooding can leave silt deposits and crop residue that can bury the crop and reduce
photosynthetic capacity significantly. Without rainfall to wash silt from the leaves, recovery is greatly slowed. It is also important to remember that fields that have been subjected to flooding are also more susceptible to nitrogen and other plant nutrient deficiencies and to some root rot diseases, including Phytophthora root rot.

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