

## **Ponding Water and Cool Growing Conditions**

*By Jim Hoorman – OSU Extension Educator, Putnam County*

Most corn and soybeans have been planted but the growing conditions have been either too cold or too wet, or both. Ohio State University corn specialist Peter Thomison says “The cold weather contributed to cork screw corn emergence and marginal looking corn due to limited nitrogen uptake. Compaction is an issue where some growers got on too early and the corn is not coming up well. We encountered the same problem on Hoytville and heavy clay soils where the conditions looked very nice on top but maybe two inches below the soil surface it was wet and gummy. It planted nicely but not too far down it was still wet and got compacted in some areas,” Thomison said. “In contrast, some corn germinated in dry seed beds and there was no moisture. The roots got dehydrated, desiccated, and are gone; so they need to be replanted.”

There were also problems with persistent rainfall. “Too much rain in some areas has made it hard to get herbicide application or nitrogen application done in a timely way,” Thomison said. “Corn got planted in one week this year and we ended up being planted a lot earlier than last year. Overall I think that was a good thing. I don’t think planting that much in a week is an issue. Given the GDDs for emergence, the difference between emergence from late April and mid-May is just a few days.”

However, last week Northwest Ohio received up to 2-4 inches of rain resulting in localized ponding. If ponding and flooding was of a limited duration, i.e. the water drained off quickly within a few hours, the injury resulting from the saturated soil conditions should be minimal.

The extent to which ponding injures corn is determined by several factors including: (1) plant stage of development when ponding occurs, (2) duration of ponding and (3) air/soil temperatures. Prior to the 6-leaf collar stage (as measured by visible leaf collars) or when the growing point is at or below the soil surface, corn can usually survive only 2-4 days of flooded conditions. Since most corn is not beyond the V5-V6 stage, it’s vulnerable to damage from ponding and saturated soil conditions. The oxygen supply in the soil is depleted after about 48 hours in a flooded soil. Without oxygen, the plant cannot perform critical life sustaining functions; e.g. nutrient and water uptake is impaired, root growth is inhibited, etc.

If temperatures are warm during ponding (greater than 77 degrees F) plants may not survive 24-hours. Cooler temperatures prolong survival of corn plants, so the lower temperatures were beneficial. Once the growing point is above the water level the likelihood for survival improves greatly.

Even if ponding doesn't kill plants outright, it may have a long term negative impact on crop performance. Excess moisture during the early vegetative stages retards corn root development. As a result, plants may be subject to greater injury during a dry summer because root systems do not developed enough to access subsoil water. Ponding can also reduce nitrogen through

denitrification and leaching. Even if water drains quickly, there is the possibility of surface crusts forming as the soil dries that can impact the emergence of recently planted crops.

For corn that's emerged, check the color of the growing point to assess plant survival after ponding. It should be white to cream colored, while a darkening and/or softening usually precedes plant death. For corn not yet emerged, evaluate the appearance and integrity of seeds or seedlings that have yet to emerge. Look for new leaf growth 3 to 5 days after water drains from the field.

A few soybean growers are seeing damping-off and uneven emergence, said Laura Lindsey, Ohio State University Extension soybean specialist. "Growers should determine the cause before making decisions on whether they need to replant soybean," Lindsey said. "To determine the cause of uneven emergence, growers can dig up seed in an area of the field that has no plants emerged to see if the germinated seed is healthy and free of disease or insect damage. If the seed is healthy and germinated but just not broken through the soil, growers don't need to worry because a little bit of rainfall will help it to continue to emerge." Some disease issues have started occurring with ponding water in Northwest Ohio, so farmers should be scouting their fields. Parts of this article were taken from interviews in the Ohio Country Journal and the CORN Newsletter (2015-15).