Purdue University Department of Agronomy

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Cold Temperatures & Early Planted, Emerged Corn

R.L. (Bob) Nielsen
Agronomy Department
Purdue Univ., West Lafayette, IN
Email: rnielsen@purdue.edu

Average daily low air temperatures over the past three to four mornings have ranged from 22F to 28F throughout a large area of Kentucky and southern areas of Indiana. This recent spate of unusually cold temperatures raises questions about injury to early-planted corn and the possibility for the eventual need to replant damaged stands of corn. The concern lays not so much in above-ground frost injury to exposed leaves, but to truly lethal cold-injury to the plants' growing points below ground.

Conventional wisdom (or agronomic legend) says that corn seedlings will tolerate air temperatures down to about 28F before serious injury occurs. One caveat to this statement is that soil temperature typically changes less dramatically than air temperature, thus delaying the onset of cold-injury to the plant's growing point region while it remains below ground. Moist soil will change temperature more slowly than dry soil, thus "insulating" the growing point further from the onset of cold-injury.

Nevertheless, the risk remains for injury to early-planted corn in southern Indiana and throughout Kentucky from these very cold temperatures in recent days. The key to the replant decision-making process will be evaluation of the health of the growing point region (Nielsen, 2004a).

Depending on the severity of damage, visual symptoms may not be evident for several days to a week after the occurrence of the potentially lethally cold temperatures. Don't worry so much about damage to above-ground leafy tissue as to the potential for injury to the below-ground growing point. Appearance of the growing point region plus visual evidence (or not) of fresh leaf tissue from the damaged above-ground whorl will be the key diagnostics for assessing condition of the stand of corn.

Corn planted, but not yet emerged may eventually exhibit what is often termed "cork-screwed" elongation of the mesocotyl or coleoptile during emergence in response to chilling injury to the cell tissue of those plant parts (Nielsen, 2004b). The worst case scenario in this situation is failure of affected seedlings to emerge; instead leafing out underground.

As with many replant decisions, patience is the key word (Nielsen, 2006). Damaged fields usually need to be given several days to a week to begin their recovery before one can confidently assess their condition and the potential need for replant. The Univ. of

Kentucky recently published several articles on corn replanting issues (Corn & Soybean News, Apr 2007).

Related References

Corn & Soybean News. Apr 2007. Corn Replanting Issues. Univ. of Kentucky. [On-Line]. Available at http://www.uky.edu/Ag/CornSoy/cornsoy7_5.htm. (URL verified 4/7/07).

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Don't forget, this and other timely information about corn can be viewed at the Chat 'n Chew Café on the Web at http://www.kingcorn.org/cafe. For other information about corn, take a look at the Corn Growers' Guidebook on the Web at http://www.kingcorn.org.