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Potential for Corn Recovery from Drought Stress?

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As the latest round of thunderstorms tease drought-stricken areas of Indiana with the hope of meaningful rainfall, growers are wondering whether renewed soil moisture at this point in the season will markedly benefit their drought-stressed corn crops. The simple answer is "yes", but the magnitude of the yield benefits will vary depending on the severity of damage already done to the crop.

In some areas of the state, drought-stressed corn is 2 to 3 feet tall and struggling to put out tassels and silks. Such severe examples of drought stress undoubtedly also translate to potential ear sizes that have already been severely compromised, in which case perfect weather from this point forward will only preserve the limited yield potential remaining in these fields.

How severely has yield been limited in such severely stressed fields? The severity of drought stress in many fields is too variable to easily estimate yield loss on a whole field basis. Within areas of some fields, eventual yield loss may be nearly 100% either due to outright death of plants or total failure of pollination or total abortion of ears. Within less severely stressed areas of the same fields, yield potential will range all over the map due to variability for potential ear size, success during pollination, and kernel survival following pollination (Nielsen, 2007a).

Agronomists often point out that ear length potential is more easily affected by stress than row number potential during the ear size determination phase prior to pollination (Nielsen, 2007b). However, that does not mean that row number determination is immune to the effects of drought stress. It is not uncommon to find potential kernel row numbers on ear shoots dissected from plants in severely stressed fields that are 4 to 6 fewer than normal. For a normally 16-row hybrid, such reductions in kernel row number translate to reductions in yield potential of 25 to 38%. Coupled with likely reductions in ear length potential, the yield potential in such severely stressed fields is quite low regardless of future rainfall.

Admittedly, there are areas of the state where crops look much better and have suffered only marginal drought stress to date. Rainfall received in these areas will help sustain a relatively good yield potential by better ensuring favorable conditions through the remainder of the grain filling period. If near-drought conditions prevail in fields with reasonably good yield potential, one consequence will be a heightened risk of weakened stalks or outright stalk rot development if plants resort to remobilizing (aka

cannibalizing) stored carbohydrate reserves from the stalk tissue to the developing kernels over the next 30 days or so (Nielsen, 2005).

Related References

Nielsen, R.L. (Bob). 2005. Monitor Corn Fields for Weakened or Diseased Stalks. Corny News Network, Purdue Univ. [On-Line]. Available at http://www.kingcorn.org/news/articles.05/StalkMonitoring-0823.html. (URL accessed 7/18/07).

Nielsen, R.L. (Bob). 2007a. Assessing Effects of Drought on Corn Grain Yield? Corny News Network, Purdue Univ. [On-Line]. Available at http://www.kingcorn.org/news/articles.07/Drought-0705.html. (URL accessed 7/18/07).

Nielsen, R.L. (Bob). 2007b. Ear Size Determination in Corn. Corny News Network, Purdue Univ. [On-Line]. Available at http://www.kingcorn.org/news/timeless/EarSize.html. (URL accessed 7/18/07).

Nielsen, R.L. (Bob). 2007c. Estimating Corn Grain Yield Prior to Harvest. Corny News Network, Purdue Univ. [On-Line]. Available at http://www.kingcorn.org/news/timeless/YldEstMethod.html. (URL accessed 7/18/07).

Nielsen, R.L. (Bob). 2007d. Kernel Set Scuttlebutt. Corny News Network, Purdue Univ. [On-Line]. Available at http://www.kingcorn.org/news/timeless/KernelSet.html. (URL accessed 7/18/07).

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