



RESEARCH UPDATE

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Post-Maturity Grain Yield Losses In Corn

STATE COLLEGE — An article in the October 1995 Farm Journal concerning a recent study on "post-maturity" yield losses in corn has received considerable attention.

The article described ongoing research by Dr. Bob Nielsen, extension corn agronomist at Purdue University, indicating that field drydown may result in significant yield losses.

Dr. Nielsen reports that he has observed a 1 percent loss in dry weight for every point of moisture dry down, and adds that if you're talking about letting corn dry down 10 percentage points in the field, you're talking about a 10 percent yield loss.

Yield losses during field dry down have usually been associated with ear droppage, stalk lodging, pest injury (for example, ear rots, animal feeding) and mechanical factors (that is, shelling at the combine head). The optimum harvest grain

moisture for corn is generally considered to be 25 percent (with mechanical damage to kernels increasing above 25 percent and mechanical harvest losses increasing below 25 percent).

However, Dr. Nielsen believes that additional yield loss may occur above and beyond mechanical harvest loss due to continued kernel respiration (metabolic consumption of carbohydrates in the seed with the concurrent release of carbon dioxide and water) after physiological maturity (black layer).

"The embryo (in the seed) is still alive and using up fuel or energy causing weight reduction." Physiological maturity is defined as the time when the corn kernel reaches its maximum dry matter content. The moisture content of the kernel at physiological maturity varies with environment and hybrid but usually averages 30 to 35 percent.

Previous research indicated

that once a corn kernel reached physiological maturity it would only lose water (as it dries down) without loss of yield.

The Farm Journal article also cited reports from growers and a seed company corroborating what Bob Nielsen has observed. However, some of my counterparts in other states have performed similar studies to determine kernel dry matter loss during drydown but have not observed yield reductions. The article noted that some hybrids may be affected more by post maturity "respiration" than others.

In a past Purdue report, Dr. Nielsen noted that these kernel dry weight decreases with drydown do not occur consistently. Field drydown after physiological maturity affected kernel dry weight in only 1 of 4 years (1985-1989) for a hybrid widely grown in the mid-'80s.

These findings would suggest that varying environmental conditions during maturity might also influence this phenomenon.

provided three units of imidazolinone resistant (IR) corn for the same demonstration plots. American Cyanamid provided Pursuit in packets that covered exactly 10 acres. The total cost of these inputs was about \$30/acre less than the farmers would otherwise have had to pay. All other inputs such as fertilizer were paid by the farmer. This year only the cover crop seed and Pursuit will be supplied at half the cost.

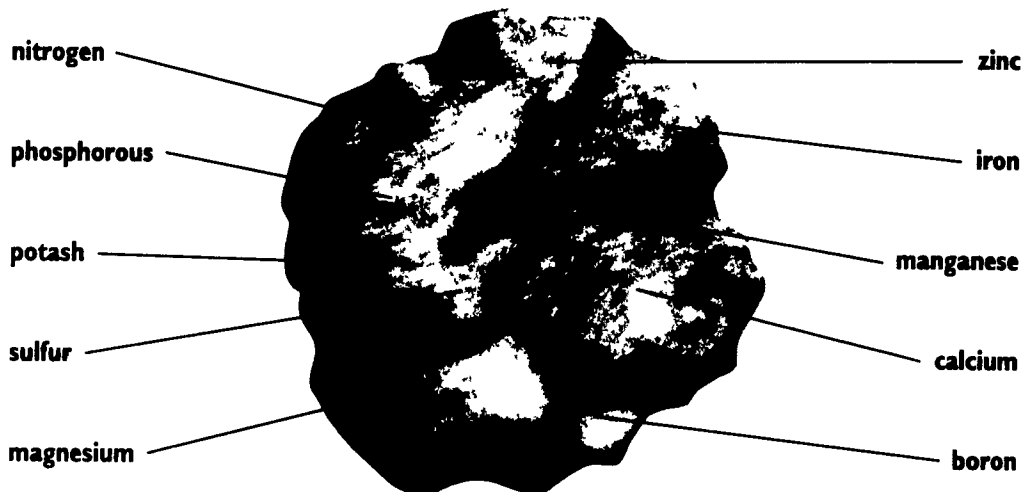
Our experience during the establishment year was generally good. At most sites, we achieved good weed control and stands of the birdsfoot/crownvetch mixture. At each site we hope to be able to come back in with no-till corn next year and suppress the cover crop enough to get good corn yields and still maintain the cover crop.

I expect that, over time, the birdsfoot trefoil will die out and we will be left with a predominately crownvetch cover crop.

Any farmers interested in trying this living mulch system this year should contact their local county agent, crop management association scout, local Natural Resource Conservation Service representative, or call Dr. Nathan Hartwig at Penn State University (814) 865-1906 for more information.

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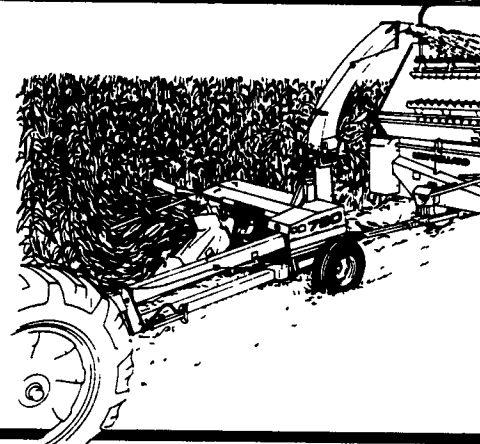
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