

# Corn Research Results

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pared the response to population of hybrids characterized by seedsmen as flex, fixed ear or prolific. The results of these studies indicates there was little relationship between a hybrids classification and its yield response to increasing the population from 18,000 and 28,000. Also this study showed that population responses are quite variable and vary from site to site and hybrid to hybrid.

Population studies are underway here at Penn State and the results will be shared as they come available.

## Row Cleaning Devices

Row cleaning devices are design to remove some of the trash or crop residue from the row to enhance emergence and early season plant growth. A number of options are available. Among them are the Dawn Trashwheel, Acra Trash-whippers, Rawson coulters, and fluted coulters.

Research done with row cleaning devices has been published from the Univ. of Kentucky and the Univ. of Guelph, in Ontario. Kentucky researchers found that residue removal increased yields in one of three years. They concluded that row cleaning would be most beneficial on cool wet soils in springs with plenty of sunshine.

Canadian researchers used the row cleaners to plant into rye cover crops. They found consistent beneficial effects of the row cleaners under these conditions. They attributed this benefit in part to reducing the allelopathic effects of the rye.

We began our research this year with several row cleaning

options. Preliminary results indicate some potential to improve plant populations by up to 3,000 ppa with some of the devices and increase soil temperatures by 2-3 degrees F. It's too early to tell what the potential of these will be, but they may be able to help improve no-till success on off-drained soils or in high residue conditions.

## Cultural Practices And Corn Rootworms

Corn rootworms have become quite severe in some pockets of the state recently. Because of this, one has to ask the question — are we doing something to receive this special treatment from this pest? When we think of some of the practices that we often recommend such as early planting, no-tillage, and sidedress N fertilizer they all have one thing in common — the potential for slow plant growth in the spring.

We were concerned that perhaps some growers may be setting themselves up for severe damage with these management practices. Two years ago, we initiated a research project to study how these cultural practices influence the damage from western corn rootworm larvae. Our results to date indicate little effect of any of these practices on rootworm damage.

In fact, one comparison has indicated that damage in 1992 was actually less where we planted early. Here, the plants had apparently had chance to develop a vigorous root system before the rootworm larva emerged. This finding contradicts the concept that early planted corn is more at risk because of reduced insecticide

availability.

The effects of a soil insecticide on reducing damage in this continuous corn have been much greater than any of the other factors in the study. This study is slated to be continued for another year.

## Stability Analyses

One technique that has been used to characterize the response of hybrids to stress is something called stability analysis.

To measure the stability of a hybrid, the hybrid yield from a number of trials is plotted against the average yield of those trials. Some hybrids may increase yields faster than average, while others may perform better at lower yielding sites.

Stability analyses could be used to place hybrids better. I recently used this approach to look at some hybrids that were entered in our testing program. I used some data from 1985, when we had 15 locations of data for our zone 1 trial. The yields of the two top yielding hybrids in the trial were plotted against the test average yields. This plot clearly showed that one of the hybrids won all of the comparisons in the low yield environments and the other won all of the comparisons from high yield environments.

Data from groups of industry strip trials could be used for this type of analysis to determine hybrid stability. These would be best if only hybrids common to all trials were used to determine the test average yields. This research confirms that growers should consider stress tolerance characteristics of hybrids in placing hybrids on different fields around the farm.



## Corn Maturity Studies

This year we have begun a new project to evaluate Growing Degree Day requirements of corn in Pennsylvania. This is a followup on some data that two students have worked on that shows that often corn hybrids in Pennsylvania require fewer GDD's to black layer than seed companies report in their literature. Our information shows that in the State College area, we grow hybrids that are rated at 2600-2700 GDD's and the often require only 2300 GDD's to harvest. These hybrids are frequently planted late into May and often have little problem maturing (except

in 1992). We are interested in determining actual GDD requirements of these hybrids so that we can better predict how far we can push maturity in many areas of the state. We have excellent long-term weather information from across the state that can be used as a resource in this problem. Summary

These studies represent only part of the corn research at Penn State. Sizeable programs are continuing in rotations, weed control, soil fertility, physiology and breeding for disease resistance. Because of space constraints, only the highlights of the studies discussed in this report could be mentioned.

# Test For Mycotoxins

Richard Adams  
PSU Extension

STATE COLLEGE (Centre Co.) — Mold problems with this year's corn crop are widespread due to the cool, wet growing season and harvesting problems.

Both whole-plant corn silage and corn grain are involved. Production or weight gain problems in livestock stem largely from the degree of mold present.

Mycotoxins also may be involved in some performance and health problems when feed is obviously moldy. However, mycotoxins also may be present when very little or no obvious mold is seen.

Moderate reductions in milk production or growth from feeding moldy grain or forages often result from depressions in the

digestibility and palatability of moldy feed.

More drastic reductions in performance of 15 percent to 25 percent or more within a few days to a few weeks may signal a potential problem with mycotoxins.

This is especially true when health problems are present, such as a marked drop in feed intake, acetoneemia or ketosis, increased incidence of displaced abomasum, hemorrhaging, diarrhea, and signs of liver or kidney problems.

Black mold, which is a major type seen in some of this year's crop, seldom produces mycotoxins, but may appreciably reduce performance.

Mold of other colors, when present in any amount, are more likely to produce mycotoxins.

Testing for mycotoxins should be considered when otherwise unexplained and serious reductions in performance occur, especially when accompanied by related symptoms.

Quick tests using immuno-assay or TLC methods may be employed for initial screening.

Tests should include both aflatoxin and Fusarium mycotoxins such as DON, DAS, zearalenone, and possibly others. Such quick tests often cost \$10-\$50 each and are available from some feed concerns, feed testing laboratories, and veterinarians.

Preferably, frozen duplicates of samples with a positive quick test should be sent for more quantitative or confirmatory testing using HPLC or gas chromatography.

While corn is most suspect this year, remember that all feeds used on a farm — including finished concentrates and especially forages — may contain mycotoxins. Therefore, other feeds also should be tested to see if they are the source of the mycotoxin or are contributing one or more mycotoxins to the problem.

Black or ultraviolet light scans are only presumptive, since many false positives and negatives may occur.

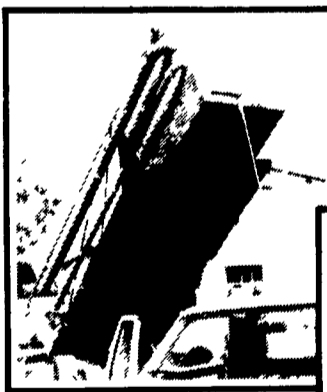
It is important to take representative samples. It is best to take and freeze a composite of each of three to five feedings. Then combine these and mix well before making a final composite for submission.

Keep a frozen duplicate for conformatory testing (requires a longer processing period) in case a positive quick test is obtained, or submit it at the same time as the initial test.

Send about one pound of dried feed, core samples from at least 12 bales of hay, or two pounds of wet feeds such as silages, haylages or wet brewers grains.

Place frozen samples in insulated bags containing frozen cold packs. Hand deliver the

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