

Plant pathologists are 'disease fighters'

DE KALB, IL. — Developing corn hybrids that will perform well for farmers is not an easy task. Besides surviving weather conditions, corn hybrids also must resist diseases and insects. Producing hybrids that meet these challenges, according to Dr. David Smith, Dekalb-Pfizer Genetics Plant Pathologist, is a year-round, never-ending job.

Plant pathology is the study of diseases. Smith and the other company pathologists must study the nature and causes of diseases, as well as the structural and functional changes those diseases produce in plants. The pathologist's job is to gain firsthand knowledge about diseases and how plants react to them.

But the job also involves supporting various divisions within Dekalb-Pfizer. Pathologists provide consultation to the sales staff on samples they receive from dealers and agronomists, and they assist the company's corn research division through their efforts in breeding plants for disease resistance. John Kinsey, Associate Pathologist, supplies pathogens (those organisms which cause disease) to all Dekalb-Pfizer corn research locations, so that breeders can evaluate for resistance at their own testing locations.

Although breeding plants which have complete disease resistance (immunity) is impossible, pathologists and breeders strive to develop hybrids that are strong enough to keep diseases from significantly affecting yields. Adding to this challenge is maintaining hybrid excellence by introducing hybrids that surpass older hybrids in quality. "We constantly have to produce hybrids which exceed the performance of those already in existence," Smith states.

To accomplish this objective, pathologists run many tests. During 1984, the reactions of Dekalb-Pfizer Genetics parents and hybrids to 22 pathogens or races of pathogens were evaluated. And in a project unique to Dekalb-Pfizer, the distribution of disease and the possibility of race formation is studied every year, as well. This project, called the corn pathogen monitoring program, has yielded valuable results, both in the movement of diseases across the country and in describing new races. Such information can be used at both the breeding level and by the company's sales and marketing staff, when disseminating information to

dealers and agronomists. "A hybrid that may be advanced to commercial status Smith and Dale Dowden, Associate Pathologist at the company's Mt. Olive, NC research facility, make over 23,000 disease observations in test plots each year. A "double confirmation" system is employed to ensure the accuracy of these observations.

This double confirmation is based on the visual rating of diseased (inoculated) plants to determine the effect the disease has had on the plants themselves, and on yield-loss tests conducted on both inoculated and uninoculated plants to determine the effects the disease has had on the plants' yields. The system provides data not only on which plants are most disease-resistant, but also on those plants which may still produce high yields even though diseased. This information may in turn be useful to the sales force when recommending the best-yielding hybrid for a specific type of growing conditions.

Providing such support to the sales force is yet another of the pathologist's duties. "Some

mornings I spend in the office analyzing samples from the field," Smith notes. That keeps me in touch with members of the sales force by helping them give a particular grower an explanation for a problem to reduce the probability of its recurrence."

Spotting these problems in time to treat them effectively is often difficult, Smith goes on to say. Sometimes when the problems are visible to the grower, the actual damage was done much earlier.

"For example," Smith explains, although many growers detect stalk rot at harvest, it's largely a result of growing conditions prior to harvest. The ground may have been wet while the plant started growing, then may have dried up while the grain was filling. Here's where the problem actually begins. Sugar was drawn from the stalk during grain filling. Under

stressful periods, stalk lodging and rotting may result because of inadequate sugar reserves in the stalk.

If it had been drier during planting and wetter later, a non-stressful year you might not have had such a problem. Stalk quality is a result of the growing season, not something that is determined just prior to harvest."

Dealing with such problems and analyzing hybrids for the world's largest seed research organization make the job of the plant pathologist a challenging one. But such efforts ultimately provide the farmer with superior corn hybrids, possessing both high yield potential and bred-in resistance to disease, insects, and stress. As David Smith concludes, "Our Dekalb-Pfizer hybrids come with built-in protection."

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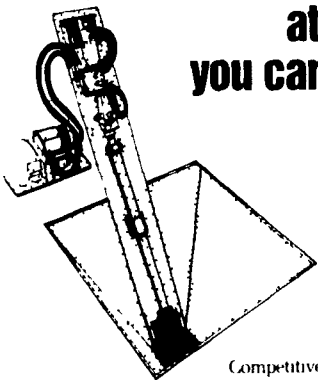
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