Consistent performance is corn hybrid measurement tool

BLOOMINGTON, Il.— After literally weathering the last four years, corn growers must search their memories to recall a "normal" growing season. Heat and drouth characterized 1980 and 1983. And "wet and late" describe 1981 in the eastern Corn Belt and 1982 in the West.

With such disparate growing conditions, how can growers tell if they are receiving good, consistent performance from corn hybrids they select? And just what is consistent hybrid performance?

"In the simplest terms, consistent performance is the ability to produce reasonably good yield under bad conditions," says Charles Brim, vice president of research for Funk Seeds International. "Consistency is a tough characteristic to accurately define," Brim adds, "because there are weather conditions under which no hybrid can perform well. Unfortunately, a lot of areas experienced those kinds of growing conditions last year."

When weather permits, however, several traits work together to make corn hybrids consistent performers, Brim continues "Yieldability, standability, disease and insect resistance and stress tolerance are the major contributors to dependable production.

"Most growers measure yield by gut feeling," Brim admits. "Everyone who farms knows that there are certain pieces of land which simply produce better yields from year to year."

Part of Brim's responsibilities as vice president of research for Funk include traveling across the country to evaluate test plots grown by farmers cooperating with the company.

"Farmers are into risk analysis now, just like other businessmen. Many of them have told me they've given up going for high yield only. They say they want hybrids that perform relatively well from year to year over a variety of conditions.

"Farmers generally put yield and standability at the top of their hybrid selection lists," Brim says. "These two traits probably should be combined into one characteristic called harvestable yield. A hybrid's biological yield potential can be very high, but without standability, the high potential is lost. So the stalk needs to be strong enough to hold the plant up until harvest, yet combine relatively easily.

"That kind of stalk results from overall good plant health, which is a function of tolerance or resistance to prevalent diseases and insects and stress tolerance. These defense mechanisms allow a hybrid to express its yieldability from year to year, over a wide range of growing conditions," the researcher says.

A hybrid's ear type may affect consistency. "Hybrids with determinant ears almost always produced one while indeterminant types may be barren under very harsh conditions," Brim explains.

With the large number of hybrids available, what's the best way to select a hybrid for consistent performance?

"Strip tests are the best technique to evaluate consistent performance on the farm," says Paul Christensen, Funk advanced testing manager. "This involves planting a few rows of four or five hybrids side-by-side and tracking yield, standability and other traits

"One year's data will give an indication of relative performance. Measurement of consistent performance requires data for the hybrid's performance over a number of years."

The following chart shows three-year evaluations for five hybrids:

Hybrid	1981 Yield	1982 Yield	1983 Yield	Hybrid Mean
A	138	110	122	123.3
B	134	108	115	119.0
C	139	112	136	129.0
D	120	104	105	109.6
E	126	120	99	115.0
Plot Mean	131 4	110.8	115.4	

Tabulations such as these can be done manually or with help from a personal computer. "VisiCalc, which is one of the most common microcomputer software programs, would work very well for a hybrid evaluation program," Christensen says.

"At least three years of data are needed for results to be meaningful," he adds. "But tests need not be run on the same land every year. The soil should be well drained and representative of the entire farm." Hybrids should not be planted in the same order every year.

To interpret data, look at individual yields in relation to the mean or average of each hybrid in the trial. For example, if the mean for the trial is 107 bushes, and hybrid A yields 122 bushels, its score would be a +15 If hybrid B yields 103 bushes, its score would equal -4.

The mean for the whole trial will serve as an indicator of the environment that year. Lower means indicate more stressful growing conditions

As individual hybrid data is evaluated, Christensen recommends looking for yields that are significantly lower than the mean, a signal of weakness under stress.

He cautions, however, than means alone may not give a true picture of a hybrid's performance. "Closely scrutinize the figures that make up the mean to see if there are any low values in the line. A consistent hybrid will not bounce around a lot in its values, but will achieve a steady average. A low yield in the line should stir suspicion. Look for additional information if a hybrid appears to perform erratically."

In fact, Christensen recommends building in yield results from sources other than just the on-farm strip tests. "Try to obtain individual location data from state universities," he says. "And neighboring farmers may want to consider cooperating on several trials and trade the results. The more that can be built into the hybrid ratings, the more reliable the final evaluations will be."

The rating system can be expanded to include evaluations for standability, test weight, and synchrony of flowering.

"There are several methods to measure standability," says Christensen, "including making three random counts of 100 plants each in the field and then figuring a percent standing rating on the count. Another, less scientific method, would be to eyeball the field and estimate the percent of plants still standing. The results of these counts can be set up on a spread sheet similar to yield ratings," he concludes.