

# How corn hybrids are made

LANCASTER — Today's farmers probably take for granted the corn hybrids they plant on their farms. Hybrids have become a fact of life for U.S. farmers during the past 40 years.

But, behind the surface of those high-yielding, new hybrids introduced each year is a battalion of people dedicating much more time, money and energy than you would expect.

It can take up to 12 years to bring a single hybrid to market. There are several phases through which corn breeders guide potential hybrids — each step taking several years.

Tracing the beginning of one of these new corn hybrids can take one to the far reaches of the world.

In order to maintain a diverse source of new germplasm, firms receive material from a variety of places.

Companies can receive germplasm material USDA has come across simply by requesting it. They also go to tropical research departments. There, they may find a native collection from another country, or the tropical researchers may develop an exclusive line.

You might suspect that eventually these sources would run low on material to supply corn breeders, but Dr. Keith Kauffman, who is the manager of germplasm resources for DeKalb, says he annually looks at thousands of resource crosses. His job — simply to locate sources and then determine if the new material will cross with another source. If it does, Kauffman passes it on to the company's corn breeders spread over a dozen research locations across the United States.

If it doesn't cross well, the source is put into cold storage for possible use later. The philosophy of this,

as Krull puts it, "who know, some day there may be a new disease, and perhaps one of these sources carries resistance."

The large research company currently has nearly 4000 completely different germplasm sources in its cold storage room at DeKalb, Illinois. That makes it one of the largest collections in the world.

Once germplasm is collected and is shown to cross well with others, the hybridization process begins.

To illustrate exactly how a knows, some day there may be a new disease, and parental inbreds must first be developed and made homozygous, which simply means inbreeding them to the degree that they will never lose through crossing the outstanding characteristics for which they were initially selected. This process is called selfing.

"Let's follow the development of an inbred for hybrid X," Krull says.

"One parent might be a proprietary line, which means it would be developed exclusively by DeKalb, while the other lines may be, for example, a public line, meaning it's from a university." These two lines are crossed and then selfed to develop a new inbred combining the desirable traits of both original lines.

This cross begins its way through the selfing process. If it's selfed once, that means it's 50 percent homozygous, or having a 50 percent chance that it will maintain its characteristics when crossed.

Generally, new inbreds are selfed five times, making them 97 percent homozygous. At this point, essentially all characteristics of the inbred are fixed and will transfer.

Each selfing takes one

year, and each year, the line is bombarded with diseases and insects in a very intense selection process. Of every 1000 potential new inbreds, seldom more than one will pass the stress tests and qualify for use in making a hybrid.

"Each year, we only take the best material to the next generation. Krull points out. "We're selecting most of all for yield, followed by drydown, emergence, leaf disease reaction, stalk diseases, stalk quality and other characteristics. By the time we're done screening these out, we only have a handful left in five years. It's a numbers game. The more material you look at, the better chance you have of finding something of promise."

As an inbred begins to look homozygous and if it is still a survivor of all the testing, it moves to yet another stage.

Preliminary crossing texts are made as the new, and still hopeful, line is crossed to several testers and then yield tested to evaluate the new inbred's performance in hybrid combinations.

This limited number of new lines may go on to more advanced screening sets, where they are studied for yet another year.

The better ones are sent to DeKalb's performance testing plots. There, they are grown under actual on-farm management practices, as DeKalb corn breeders decide how well they will perform in your field. Once again, the firm limits the number that pass this phase of testing.

Once the line looks promising in crosses, breeders at each location also begin crossing it with all of their better lines, hoping to come up with a good match that will result in a new, improved hybrid.

"We have a philosophy that we don't put a new

hybrid out unless it's better than the ones currently on the market. That's the toughest test we can give it," Krull says.

After the breeders develop an improved hybrid, pilot production is started to obtain foundation seed. This seed is distributed to the numerous production plants, where commercial seed supplies are multiplied.

Finally, the hybrid is yours.

The previous example illustrates the general steps that the larger seed companies take to bring you better hybrids. Of the 700-some companies registered with the American Seed Trade Association, only a few conduct such large-scale, in-house research programs.

The research process is

expensive and time consuming. Normally, only the larger companies have the resources to conduct extensive research efforts. However, the efforts of these companies are complemented by the work being conducted at universities and other public institutions.

It is from this source that most smaller, regional companies obtain the breeding material to develop their hybrids.

The risk involved in that is that many companies may sell exactly the same hybrid, even though each company designates a different number to it.

Most farmers probably aren't aware of how broad the germplasm base for hybrids really is. The large

germplasm base is a natural result of the constant search for improved lines by companies with extensive research programs. And, working to the farmer's advantage is the fact that the private seed industry is so competitive.

The hope of each breeder at each private company is to be the one who develops that new, "barn-burning" hybrid that is better than the competition. That means you're the benefactor.

DeKalb researchers, alone, are looking at more than 14,000 potential hybrids this year. With those kinds of numbers, they can't miss if the search for improved hybrids. And, that means you can't either.

## Lahman LITTLE DIPPER

### COMPACT HYDROSTATIC LOADER

When it comes to farm chores construction digging, hauling, loading, material handling and stacking in factories and warehouses. This compact loader will squeeze through a 42" door, gate or aisle, lift 800 lbs. up to 7 feet high, AND above all, its economical to own.

The Little Dipper with Trencher

The Little Dipper Single Stage Snow Blower

A soil preparation machine the Little Dipper with a Rototiller

The Little Dipper with Grapple Fork

The Little Dipper with a Fork Lift

The Little Dipper with the Lahman Post Hole Auger

The Little Dipper with Manure Fork

The Little Dipper with the Lahman Dirt Bucket

The Little Dipper Loader with the Lahman Log Splitter

Lahman Manufacturing Company, Inc.  
Hecla, South Dakota 57446  
Telephone (605) 584-2171

The Favonte Factory Showroom

## YOUR COMPLETE SMALL ANIMAL EQUIPMENT CENTER!

Whatever you need for successful small animal raising you'll find in the 1100 square-foot Favonte Factory Showroom. From 100 ft rolls of welded wire for the do-it-yourselfer to prefabricated all metal Lifestyle enclosures. Clips, Pliers, Feeders. Even complete modular rabbit raising systems. All at low direct-to-you prices. Stop in today and save!

Favonte Manufacturing Inc. 114-116 Earland Industrial Park Building #1 Just East of New Holland of Route 23 Or phone (717) 354-4586

Open weekdays: 7:30 AM to 4:30 PM  
Fridays: 7:30 AM to 6:30 PM  
Saturdays: 7:30 AM to 11:30 AM

### FAVORTE LIFESTYLE SYSTEMS

<p><b>BEAVER SMALL ENGINE REPAIR</b> James Creek, Pa.</p> <p><b>CLARKS FARM SUPPLY</b> Williamsport, Pa.</p> <p><b>PAUL DOTTERER FARM EQUIPMENT</b> Mill Hill, Pa.</p> <p><b>FLINNER FARM EQUIPMENT</b> Prospect, PA</p> <p><b>GEORGE N. GROSS, INC.</b> Dover, Pa</p> <p><b>AL HART</b> Cochran, PA</p> <p><b>HETRICK FARM SUPPLY</b> New Bethlehem, Pa</p> <p><b>HUTTON FARM EQUIPMENT</b> Mahaffey, PA</p> <p><b>LARIMER FORD TRACTOR</b> Greenville, Pa</p>	<p><b>LASPINA EQUIPMENT</b> North Huntingdon, Pa</p> <p><b>MCCONNELLSBURG MOTOR IMPL. CO.</b> McConnellsburg, PA</p> <p><b>R.T. MARKLE FARM EQUIPMENT</b> State College, Pa.</p> <p><b>MONTGOMERY IMPL. CO.</b> Mansfield, PA</p> <p><b>NORTH EAST EQUIPMENT CO.</b> North East, PA</p> <p><b>CLAUDE H. RINEHIMER</b> Berwick, Pa</p> <p><b>SAGAN TRACTOR SALES</b> Titusville, Pa</p> <p><b>SHUEY SALES &amp; SERVICE</b> Ono, Pa</p> <p><b>TICKLE EQUIPMENT</b> Kittanning, Pa</p>	<p><b>UNIONTOWN FARM EQUIPMENT</b> Uniontown, Pa.</p> <p><b>C. J. WONSIDLER BROS.</b> Quakertown, Pa.</p> <p><b>C. J. WONSIDLER BROS.</b> New Tripoli, Pa.</p> <p><b>YINGLING IMPL. CO.</b> Gettysburg, Pa</p> <p><b>IVAN ZOOK</b> Belleville, Pa</p> <p><b>AG INDUSTRIAL EQUIPMENT</b> Rising Sun, Md</p> <p><b>GALLUP &amp; TEN HAKEN</b> Clymer, NY</p> <p><b>FRANK RYMON</b> Washington, NJ</p>
---	--	---

Contact the above Dealers for information and Demonstrations. If not near a Dealer, write for literature and price list. Dealerships open in some areas

**Wayne R. Wyant, Factory Representative**  
Hawthorn, Pa. 16230 Phone (814) 365-5100