Farm Talk

by

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Ever since the phenomenal success of hybrid corn in boosting crop yields, plant breeders have been searching for ways to hybridize other crops. So far, they haven't had a lot of luck.

The hybrid corn story has been told and retold as one of the great success stories of agricultural research. Those plant breeders of the 1930's, who turned that period's 25 and 30 bushel corn yields into today's 100 bushels plus per acre, set the pace for others who followed. But the knowledge gained with hybrid corn isn't easily transferred to other crops, particularly soybeans.

It's been generally assumed that average soybean yields around 30 bushels per acre would increase dramatically if the hybrid process could be introduced. And that our national average would skyrocket the way of hybrid corn, if the plant breeders could just get it all together.

But it's not that easy, according to Randy Nelson, a University of Illinois agronomist, who recently completed a research project on hybrid soybeans. He says it's not just a matter of producing a hybrid bean, but producing one that is better than pure lines. He also points out that the hybrid corn success story didn't happen overnight. It was the result of 30 or 40 years of research, and Nelson says that maybe great soybean yields through hybridization will be possible in the future. But right now, the practical restraints are overwhelming.

A hybrid is an offspring of genetically unlike parents Hybrids are produced by interplanting selected male sterile and male fertile plants. Cross pollination of male sterile plants by pollen from male fertile plants leads to hybrid seed formation.

Two major obstacles prevent the commercial use of hybrid soybeans. First, soybeans are self-pollinated. That means that both the male and female parts are present on the same flower. Pollen that is produced by such a flower also pollinates that flower, so the first step in producing a hybrid is to prevent self-pollination. Then there's the problem of moving pollen from the pollen parent to the seed parent. The Illinois researcher says chemical, genetic, or cytoplasmic methods of preventing self-pollination in the seed parents is needed before hybrid soybean seed can be produced on a commercial scale.

In 1971, the first male sterile gene was found in soybeans and since then several more have been found. These genes prevent viable pollen from being formed. As a research tool, that enables scientists to get some plants that are male sterile. But with this method, at best only half will be male sterile and half fertile. So this requires pulling out at least half the plants, the ones that are fertile. To do this, a researcher has to look at the individual flowers of each soybean plant to see if they're shedding pollen. It's very time consuming and therefore not practical on a commercial basis.

Another method, cytoplasmic sterility, which exists in corn, may be discovered in soybeans, but that hasn't happened yet.

And even if a mechanism is discovered for obtaining male sterile soybean plants, there's the

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