

## Penn State Examines Promises, Potential For Narrow-Row Corn

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ROCKSPRING (Centre Co.)  
— Research on corn row widths could prove fruitful — literally — by increasing the amount of corn harvested per acre.

Now, only if the researchers could work out planting and harvesting challenges . . .

Potential benefits of using 15-inch rows instead of the standard 30-inch rows include an earlier canopy, better weed control, improved soil conservation, more nutrient uptake, and possibly higher yields, according to Greg Roth, associate professor of agronomy at Penn State.

At this year's Weed Field Day held at the Landisville Research Station, Roth spoke about the ongoing research at Penn State to study the potential of narrower corn row widths.

Penn State has put out "a number of simple trials at a number of locations" comprising four years of research, said Roth. There are 10-15 sites in the database and five locations.

"Results have been generally pretty promising," Roth told

those who attended the Weed Field Day. Penn State has investigated two different systems, using 30-inch rows at a population of 27,000 plants per acre and 15-inch rows at a population of 34,000 plants per acre.

At this year's Ag Progress Days, displays showed some of the promising results of initial research. In 1993, yield response climbed to 7 percent. In 1994, researchers at Rockspring saw an 18 percent yield response.

At this year's Ag Progress Days, Steven Smith, Penn State research assistant, provided information on the narrow width corn rows. A demonstration plot showed 15-inch rows planted at a density of 34,000 plants per acre. The demonstration seedbed was planted May 10.

Smith said the biggest challenge facing growers is adjusting the right equipment and that, during planting and harvesting, the equipment moves slower than conventional 30-inch plantings.

Roth said the yield increases at Rockspring were "probably above normal and mostly due to



At this year's Weed Field Day held at the Landisville Research Station, Greg Roth, Penn State associate professor of agronomy, far right, spoke about the ongoing research at Penn State that examined the potential of narrower corn row widths. From left, Bill Curran, weed specialist; John Yocum, research station manager; and Roth.

the increase in population."

Researchers are looking at silage use of the narrower rows, which is being adopted readily in New York, according to Roth. One location in Quarryville, Lancaster County, showed a 3.5 percent overall increase, giving a very good, 30-ton silage yield.

A site in Lebanon showed a 1 percent increase, for 22 tons of silage.

Rockspring showed an 11 percent increase, for a 23-ton corn silage yield increase.

"Our early results are sort of saying there might be some room for this," said Roth.

Roth pointed out that the greatest potential may be for parts of northern Pennsylvania, where the corn remains short well into the season and canopies over later, and where it is more difficult to obtain good stands. These areas "might benefit more from the narrow rows than down here in the southeast," said Roth.

The researcher wants to see if his theory holds out — that as "we move north, we're probably going to see these narrow rows pay off more nicely."

The problems growers face

include retooling equipment to plant and harvest narrow-row corn and working around the problems of applying pesticide and fertilizer products post-emergence.

Research at the USDA Beltsville, Md. laboratory has shown benefits with reducing herbicide rates with narrow row corn and improved weed control.

The potential for using narrow-row corn is "the kind of thing I want to take a good, long look at," said Roth. He told growers at the Weed Field Day, "When we make our decision about it, I'll keep you informed and hopefully you'll get behind us if it looks promising for some areas."

## Watch For Serious Corn Stalk Lodging

COLUMBUS, Ohio—An Ohio State University agronomist cautions farmers to watch for serious corn stalk lodging problems at harvest because of the effects of the past growing season's weather and disease stresses.

Peter Thomison said drought and hot weather during the corn plant's grain-fill stage, combined with widespread late-season foliar disease damage, have increased the likelihood of serious stalk rot problems in many Ohio corn fields.

"Given these prospects, growers in some areas could incur significant grain losses if they delay field harvest to allow for natural drydown," Thomison said.

Healthy stalks require enough carbohydrates produced by photosynthesis to keep both pith cells and root cells alive during grain fill. However, photosynthetic activity was sharply reduced by either drought or heat from July through early September, and carbohydrate levels were insufficient for developing ears, in some cases. Stressed plants compensated by transferring carbohydrates to the ear, resulting in premature death of pith cells and root tissues. This predisposed plants to root infection and stalk rot fungi.

In addition to drought stress during grain fill, the past growing season was unfortunately favorable to the development of foliar diseases that weakened the stalks. The most

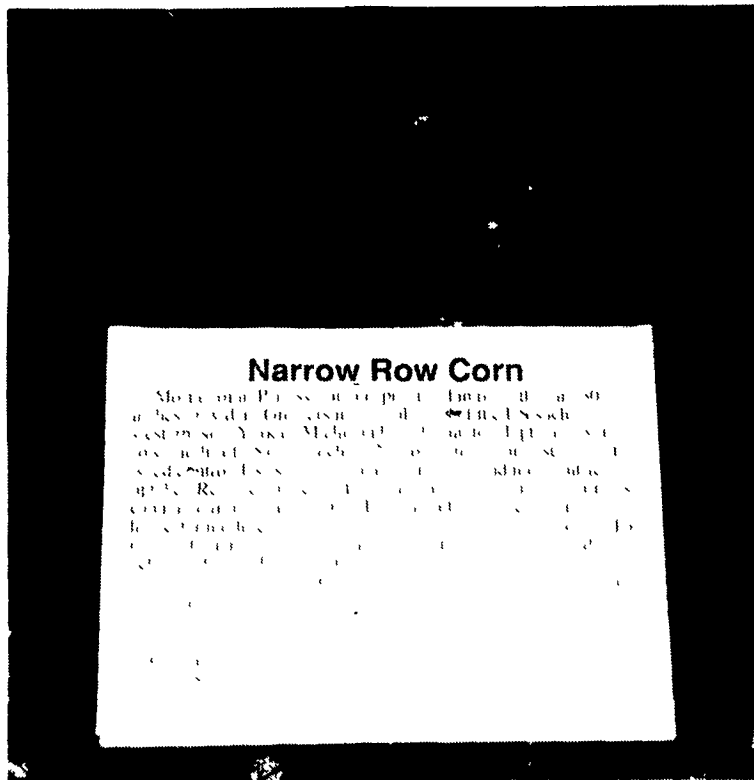
important by far is gray leaf spot, while Stewart's bacterial blight was evident to a lesser degree. Second-generation European corn borers also injured stalks in some areas.

Other stresses that can increase the likelihood of stalk rot are tissue loss from hail damage, insect or chemical injury to the root system, high levels of nitrogen in relation to potassium in the soil, compacted or saturated soils restricting normal root growth, and high plant populations.

In most hybrids, stalk rot symptoms do not show up until shortly before the black layer stage, coinciding with physiological maturity. The main fungal pathogens causing stalk rot in Ohio are *Gibberella*, *Collectotrichum* (anthracnose) and sometimes *Fusarium*. It is often difficult to distinguish between stalk rots because two or more fungi may be involved.

Assessing a potential lodging problem is fairly simple because the deterioration of inner stalk tissues is a symptom common to all stalk rot. These tissues will easily compress when squeezed between the thumb and finger. Use this "squeeze test" to determine the extent of stalk rot throughout a field. Give the most damaged fields priority at harvest.

"This is not the year to allow corn to dry in the field to moisture levels of the low 20s or high teens before harvest to save on drying costs!" Thomison said.



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