

Growing corn in Upper Plains: Can management help?

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MANDAN, N.D. -

Early-season hybrids do not seem to respond to skip row corn planting as well as later-season hybrids, according to research being conducted at the Northern Great Plains Research Laboratory (NGPRL) in Mandan, N.D.



Don Tanaka, NGPRL soil scientist, said researchers are conducting corn management studies to look into this concern.

Producers and others at Friends and Neighbors Day in Mandan, N.D. listen to the latest in corn management research from Joel Ransom, NDSU.

“We don't know why this is happening,” he told a large group of producers and others gathered at Friends & Neighbors Day 2008. “We are trying to see if this could be because of the genetics or the way we are managing the corn.”

Skip row planting is one of the corn management practice research studies the lab is conducting that could help growers when moisture is a problem. Skipping rows forces roots to find precipitation left in the gaps, Tanaka said.

“We're trying to figure out management schemes and time frames that we can plant so that, even in dry years, you are able to meet your cost of expenses and in good years, you exceed those and make a profit,” he said.

In 2006, corn was starting to burn up this time of year. “We are hoping to get by that, if we can, through management,” Tanaka said.

He added skip row was a technique being utilized in the central Great Plains to try and avoid drought stress during that critical time of silking and tassling.

In the current ARS planting study, they are using eight hybrid varieties with two populations and three management methods.

Joel Ransom, NDSU Extension agronomist, told corn growers cool weather in the spring was one of the main issues affecting the corn in many areas this year.

“We are already behind our normal (growth) and it's not just North Dakota, this is a trend throughout the corn belt,” he said.

Temperature and corn growth have a good relationship, and it takes about 120 growing degree days before the corn will emerge in the Upper Northern Plains.

The growing season for crops depends on the number of growing degree units between the crop's emergence date and physiological maturity. Growing degree units are calculated on accumulated temperatures above 50 degrees. There is one growing degree day unit calculated for each degree above 50 degrees, he added.

“It takes 80 degree growing units before a new leaf will form, and for the central part of North Dakota, about 1,000 growing degree units is needed before silking,” Ransom said.

Reaching maturity will take about 2,000 growing degree units, depending on the variety.

“Today (July 17) I pulled up the NDAWN system and for Mandan, we were at 893 growing degree days. We'll pick up 20 more today on this warm day,” he said. “That gives you an idea of how fast they (growing degree units) accumulate.”

The long term average shows that central North Dakota should be at about 1,040 growing degree units by this time (mid July).

“So Mandan should normally be at silking right now, and we're probably at the eight or nine leaf stage,” Ransom said. “We are substantially behind normal this year.”

In 2004, another cold year, central North Dakota was probably about 20 degree growing units ahead of where the area is at the present time.

“The question on everyone's mind is, ‘Are we going to catch up?’ ‘Can we catch up?’ We are 150 growing degree days behind normal, and we are in the middle of July,” he said. “Is there any possibility we can catch up?”

Ransom recently spoke with a corn grower in Lisbon, in southeast North Dakota, who commented the times of the year when producers really make changes in GDDs accumulation to normal years are in the spring or in the fall.

“We passed up spring. It is hard to catch up in the middle of summer because you are maxed out in terms of growing degree day accumulations, but the question will be how will September be in terms of accumulation,” Ransom said.

At the end of May, North Dakota typically averages 12 degree growing units a day, and at the end of July, that number rises to 20. By the end of August, that number begins falling back to 14 and at the end of September it is down to 8 growing degree units, he said. “We're about 5 to 8 days behind in calendar days,” Ransom said. “We are behind, and if we don't catch up, that means we are going to have corn with a lot more moisture than we

would like to have.”

He said there is a direct relationship between corn dry down and growing degree units as well.

“It is hard to predict how fast the corn will dry down because you have factors like when did it start?” he added.

Last year in Carrington, N.D., Ransom said they were monitoring corn dry down in the middle of the season.

“We had a nice little rain shower and guess what? Moisture went up. Those are factors that complicate this relationship,” he said.

Corn taken for grain will hopefully be dry enough by Nov. 1.

“Typically, you have very poor conditions for drying out in the field in November,” Ransom said.

Last year was an exception and North Dakota accumulated 46 growing degree units in November 2007.

“Let's hope we have another fall like that because that really helped us getting things dried,” he added.

Tanaka said when growers consider planting corn, they need to think about what type of plant was previously in the field.

“You have to make sure and pick your crop residue to plant corn into in order to get a good crop,” Tanaka said. “Spring wheat is the least sensitive crop as to where you put it into a crop system.”

Crop sequencing studies that ARS-Mandan conducted over the past several years showed grain sorghum to be the most sensitive crop in a crop rotation followed by corn.

Corn planted on corn residue gives the lowest yields in the studies.

“One of the worst things you can do is monoculture corn. Corn on corn - that's not a good thing to do,” Tanaka said. “If you are going to do anything, put corn on sunflowers. You get a 40 percent increase in yield if you do that.”

He added for those serious about planting good quality corn, the crop should be planted on legume residue.

“Corn - (a warm season grass) - planted on another warm season doesn't do nearly as well as corn planted on a cool season broadleaf legume or canola,” Tanaka said.

Corn planted on wheat is “fairly good,” he said, but producers need to consider the weather.

“This year we were cool and wheat produces a lot of residue,” he said. “In that production of residue, it keeps that soil from warming up for corn production.”

Proso millet and grain sorghum are also high in residue. While often good residue is a positive move to plant into as a way of conserving moisture, Tanaka said that doesn't always work in a cool spring.

“The problem would be we could not get the crop up and growing in the spring. On peas, this crop took three weeks to come up,” Tanaka said.

He added that another corn plot at NGPRL planted into grain sorghum took four weeks to come up this year.

“It depends on the year. In a warm year, residue is your friend. On a cool year, we don't get that benefit,” he added.

While a legume, planting corn into alfalfa can be a problem because of water deep in the profile, Tanaka said.

When there is little subsoil moisture, such as what is going on with the corn planted in some regions of central North Dakota, the corn is “living off of rain,” he added.

“Today, it is sunny and hot and look how the leaves are starting to roll,” he said, pointing to the corn growing behind him.

From November 2007 to April 2008, the Mandan-Bismarck area has gone through the driest period it has experienced in 113 years, Tanaka said.

“Since the end of April through June, we have had about five and one half inches of moisture,” he said. “That is about average but you have to remember, we did not have average moisture.”

Tanaka said while silking is the most critical time for the plant, emergence is just as critical.

“This corn was planted May 6. Ears would be out already on a good year. So we are in an abnormally cool year,” he said.

In years like this one, crop diversity helps, he added.

In addition, crop maturity is another factor to look at, according to Ransom.

“In a dry year is an early maturity variety better or is it better to have a late one that will maybe work through it?” he asked.