Is It Ever Too Dry To Grow a Plant?

By Kris Ringwall
Extension Beef Specialist
NDSU Extension Service

Now that we've had a frost, it's time to reflect on our previous growing season. With the prices being offered for crops, most producers have to ask themselves if they could have squeezed out a little more production.

Ranchers involved in animal production can look over the fence and see what farmers (those more involved in plant production) are up to. The Dickinson Research Extension Center used that principle when Roger Ashley, Extension Service agronomist, and Dickinson State University student Wesley Messer, investigated the possibility of double-cropping.

Ashley and Messer presented their findings at the 2007 DREC field day in July. Messer began the report by noting that forage production has been limited to one crop per year by producers in past years.

For many of us, that is very true. We convince ourselves that one crop is as good as we are going to get and that is it. Again, high prices and increased values certainly would beg the question of more production.

"Due to land use constraints and the need to remain economically viable, producers need to strive for new ways to remain productive," Messer said. "It may be possible with improved no-till equipment and management to harvest two forage crops in one year."

Allowing one's mind to wonder and recalling various management decisions and operations that allow us to get a second crop off a piece of ground, Messer and Ashley turned to historical weather data at the DREC. Their objective was "to look at 100 years of data and determine the theoretical potential to grow two forage crops in one year."

Using temperature and precipitation data available from 1905 through 2005 and the remaining data from a 15-year summary of the North Dakota Agricultural Weather Network station in Dickinson, Messer and Ashley were able to accomplish their objective of calculating the daily evapotranspiration and crop water use based on the Penman equation.

"The Penman equation requires daily maximum and minimum temperatures, precipitation, average wind speed, solar radiation, dew point and relative humidity," Messer said.

Using peas and sorghum, Messer was able to calculate an estimate of the number of years that the crops would have been stressed (soil water equivalent was less than 4.4 inches of water in silt loam soil) or when the plants would have hit a point of no return, which is referred to as permanent wilt point (soil water equivalent was 0). When water stress occurs, yield will be proportional to the water deficit. The crop dies when water stress becomes extreme (permanent wilt point).

Interestingly, in the 100 years of weather data examined, they estimated that field pea forage in the Dickinson area hit the permanent wilt point seven years. Sorghum, the second crop in the proposed double-crop scenario was projected to be more difficult to produce because 18 years in the 100 years studied resulted in the crop hitting the permanent wilt point. On coarse, textured soil, the stress and wilt points will occur more often.

"With proper management, advanced equipment and available soil water, it may be possible to successfully harvest two forage crops in one year," Messer concluded.

With prices the way they are, that sounds good and worth pondering as next year unfolds. Ashley said a producer from the Manning area whom he and David Twist, Dunn County Extension agent, are working with, provided an update on his second cut of alfalfa from a field toured during the DREC field day.

"Earlier this summer, the producer harvested 2.1 tons dry matter (DM) of hay per acre for the first cutting," Ashley said. He harvested an additional 1.4 tons (DM) per acre the week of Sept. 3. July and August were dry in the Manning area (about 1.5 inches total), so the added production was great."

The bottom line is to take some time to review the old concepts, but check into new ideas because technology keeps changing. Even if rain is scarce, with the right crop, techniques and an open mind, there is a chance the cattle will eat.

May you find all your ear tags.

Your comments are always welcome at www.BeefTalk.com.

For more information, contact the NDBCIA Office, 1041 State Avenue, Dickinson, ND 58601, or go to www.CHAPS2000.com on the Internet.

Years of water-stressed and unstressed production in a double-cropped forage system from 1905 to 2005

Years of	Peas (1st crop)	Sorghum (2nd crop)
Nonstressed Crops	60	39
Crop Stress*	40	61
Permanent Wilt	7	18

*Includes years when permanent wilt occurred.