

## **Agriculture in Northeast North Dakota**

The Langdon Research Extension Center conducts agricultural research to address the needs of producers in a nine county area in northeastern North Dakota. These counties include Towner, Cavalier, Ramsey, Rolette, Walsh, Nelson, Grand Forks, Pembina and Benson. These nine counties include approximately 5.9 million acres of cropland. Although this represents only 15 percent of the state's total farmland it produces 30 percent of the state's hard red spring wheat, 32 percent of its hard red winter wheat, 18 percent of its flax, 28 percent of its barley, 23 percent of its sunflowers, 63 percent of its drybeans, 60 percent of its potatoes and sugarbeets, 14 percent of its soybeans and 50 percent of its canola, based on 2006 production figures. More than \$971 million in annual agricultural production from crops livestock and government payments were contributed to the state's economy in 2005, 20 percent of the state's total. The Langdon Research Extension Center is central to improving vital agricultural industries of the region. Producers in this region rely on Langdon Research Extension Center and off-station locations for crop management, plant pathology, insect, weed science, soil science and dryland cultivar research information.

Northeast North Dakota contains three distinct climatic regions. The Northern Red River Valley, with its rich black soils, the Canadian border area, with the state's coolest temperatures and shortest growing season, and the Devils Lake Basin with black glacial soils. Precipitation averages 18-20 inches while the average growing season temperature is 61.4°F (May-September). Growing season degree-days (base of 50<sup>0</sup> F) range from 1600 to 2000 and frost-free days from 106 to 130. The Western portion of the region receives less rainfall than the eastern portion and the Northern portion of the

region is cooler than the southern portion. Saline and sodic soils are common throughout the area.

Producers in northeast North Dakota depend upon improvements in cultivars to remain competitive in regional and world markets. The release of a new improved cultivar is often an effective form of rural economic development. The release of the hard red spring wheat 'Alsen' in 2000 with its moderately resistant reaction to fusarium head blight (FHB) had a significant impact on the economics of northeast North Dakota that had been devastated by the disease the previous seven years. Producers typically quickly accept new cultivars of traditionally grown crops as this is likely the easiest change they can make to improve productivity. The development of genetically improved crop cultivars is time-consuming in terms of research evaluation requirements. Crop cultivars need to be evaluated each growing season to determine their full yield potential and tolerance to biotic and abiotic stresses. Yield advantage is often the most influential trait that a producer examines but other traits such as test weight, grain protein and oil content, superior disease tolerance, greater lodging tolerance, and improved quality of the end product all play significant roles in cultivar selection. Many of the superior traits in cultivars are specific to a particular area or region of the state. These varying responses of crop cultivars to environments necessitate the need for regional testing and off-station testing within a specific region.

Producers are continually searching for new crop production management strategies that will increase their efficiency and economic return per acre. Production practices are often modified in response to new economic scenarios, alternative crop uses, and changes in new technologies related to production. These new practices often come

from agribusiness, farmers other research organizations and may include new herbicides, fungicides, insecticides, fertilizer formulation, and field equipment among others. These new cultural practices or agronomic inputs need to be researched to insure that changes in present farming practices will increase crop production and profitability for the producers. As crop management practices are refined, crop production becomes more efficient, enabling farmers to become more competitive in the market place. An integrated approach to this research is required and involves disciplines and scientists from the Research Extension Centers and related departments at NDSU.

Alternative crops will play an increasingly important role in diversifying agriculture in northeast North Dakota. Crops such as sunflower, canola, drybean, field pea and lentils were once considered alternative crops but acreage has grown considerable across the state and they are now considered legitimate cash crops. Testing by the Langdon Research Extension Center for crop adaptation has determined that some traditional and alternative crops such as lentils, safflower and chickpeas are not well adapted to this region of the state. Producers rely on research to determine crop adaptability and best management practices for new crops. A continued research effort is needed to define economic viability and provide basic crop management information on existing and potential new alternative crops for the region.

Plant diseases and weeds continually plague producers and result in economic losses each year. Disease pressure on small grains and broadleaf crops has dramatically increased since the current wet cycle began in 1993 which is responsible for the protracted fusarium head blight (FHB) epidemic. Fusarium head blight has cost producers of barley and wheat nearly \$3 billion in North Dakota and Northwest

Minnesota from 1993-2000. Likewise, sclerotinia, a devastating disease of broadleaf crops, has caused serious economic losses and was estimated in 2000 to cost canola producers \$18 million in North Dakota. New and labeled fungicide need to be evaluated to determine the most effective and efficient products, both agronomically and economically. Wheat cultivars can vary in their response to fungicide applications and responses are vitally important for producers to know to make the correct decision in deciding whether to spray or not.