

# Langdon Research Extension Center

*'Specializing in crop production research for northeastern North Dakota.'*

## Research Focus - in brief

- Cooperative research with Fargo-based projects, particularly potato, barley and durum breeding
- Crop variety and alternative crop testing
- Tillage and cropping system research
- Cereal crop and row crop disease management using cultural, chemical and nutritional control as dictated by the environment
- Foundation seed increase and sale.

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The Langdon Research Extension Center's (LREC) primary emphasis is to assist the region's producers develop cropping systems that increase productivity and profitability while conserving the region's natural resources. The completion of the new Vic Sturlaugson Learning Center in 2004 will usher in a new effort at the LREC to combine the concepts of agricultural research, information technology and regional economic and community development.

## Location

The LREC is located one mile east of Langdon, ND on State Highway 5. Located between the northern Red River Valley, the Devils Lake Basin, and the north border region, it is characterized by extreme environmental differences.

The area has rich soils and high precipitation resulting in high yields but also a short growing season and a high level of disease incidence.

## Operations

The LREC operates on 389 acres of land and rents additional land on an annual basis. Off-station testing is done at five sites in cooperation with landowners, extension agents and county agricultural improvement associations.

The center includes a seed cleaning plant and storage facilities and a learning center. The new learning center is designed to combine agricultural research, information technology and community and economic development resources.

## Advisory Board

Two advisory boards help determine the center's objectives and priorities. A 19 member LREC Advisory Board includes members from each of the nine surrounding counties including local legislators. An NDSU Extension Advisory Board includes all extension staff in the area plus constituents from the region.

## Grower Education

Producers learn the results of the center's research through an annual field day, off-station tours, meetings, written reports and through the NDSU Extension Service.

## Research Highlights

**Durum breeding program:** The LREC plays a pivotal role in the durum breeding program. All durum varieties released by NDSU have come from Langdon's durum nurseries.

**Potato varieties** - The LREC has a major role in the development of new potato varieties. All potato varieties released by NDSU have been selected from Langdon's first generation potato nurseries. 70% of potatoes grown in the Red River Valley are NDSU varieties.

**Plant disease** - Emphasis is placed on studying plant diseases to enhance understanding and evaluation of management strategies. Research includes strategies to optimize cereal crop yield and quality. Another major emphasis is disease management in oilseed and row crops.

**Weed control** – New technologies are being developed as a result of weed control research focusing on chemical resistance, herbicide injury and crop safety.

**Crop Variety Testing** The center trials new and existing varieties of cereal crops and alternative crops to assess the suitability to the region. This includes small grain, flax, corn, sunflower, soybean, dry beans and canola.

## Future Direction

The LREC will serve as NDSU's outreach center for northeastern North Dakota. Its location provides crop research challenges related to a cool and moist climate and possible extensive salinity problems in this region. Additional efforts will be developed to address issues concerning rural community and economic development.

# Research Focus

## Crop trial variety information

### *HRSW and Durum.*

New varieties tested include - Dapps, Oklee, Polaris and Saturn.

### *Hard Red Winter wheat*

New variety tested - McClintock (Canada)

The winter wheat trial in 2003 was planted into flax strips on fallow in order to trap snow for increased winter survival.

### *Oats*

New varieties tested include – Reeves, Buff (naked hulled) and AC Pinnacle.

It was noted that there was limited amounts of crown rust present in 2003.

### *Barley*

Off-station variety trials were conducted. Lacey, Drummond, Legacy and Tradition have been approved by AMBA as recommended malting varieties.

### *Flax*

New varieties tested included – CDC Mons, Lightning and Prairie Blue

### *Soybean/canola*

Two trials were conducted on each of these crops – a Roundup Ready trial and a conventional trial.

Further information on the results for trials can be found on the website or by obtaining an annual research report.

Crop improvement and disease management research focused on the following issues.

- Use of adjuvants to enhance the efficacy of BASF 510 (Endura) fungicide for control of *Sclerotinia sclerotiorum*.
- Trials to determine if white mold, (*Sclerotinia sclerotiorum* (Lib.) de Bary), infections could be reduced in canola by calcium supplement at an early growth stage.
- Research to determine if different tolerances exist among canola lines for control of white mold and the effects of one Ronilan fungicide application.
- Fungicide efficacy at two application timings for control of pasmo disease in flax.
- Barley cultivar response to fungicide application for the control of *Fusarium* head blight (FHB) and leaf disease.
- Durum cultivar response to fungicide application for the control of FHB.
- Adjuvants to enhance the efficacy of foliar fungicide for control of FHB.
- Evaluation of spray volume, sprayer systems, and orifice orientation to improve the efficacy of JAU 6476 fungicide for control of FHB.
- A new fungicide JAU 6476, prothioconazole, has shown improved efficacy in the control of FHB on durum and hard red spring wheat and reductions in deoxynivalenol levels compared to most of the currently labeled fungicides on small grains. Research will assist growers understand the consequences of different rates under different environmental conditions and infections from different causal organisms.
- Evaluation of BASF fungicide Headline (pyraclostrobin) applied at recommended rates for leaf disease control and applied at different stages of growth to HRSW. Research will assist growers understand the consequences of different rates applied at different growth stages.
- Evaluation of field scale spray systems with differing application technologies for enhanced control of FHB.
- Tests on planting rate influence on yield and agronomic traits of hard red spring wheat in northeastern North Dakota. In this study, the average percent emergence of the 1.0, 1.5 and 2.0 million seeds per acre planting rate at 16 environments was 86 percent. To obtain an established plant stand of 26 plants per square foot, a producer should use a planting rate between 1.25 and 1.40 million pure live seeds per acre assuming a 10-20 percent reduction in stand. Anticipated stand losses of greater than 10-20 percent would require further adjustments to planting rates.
- Research the effect of inoculant type, inoculant placement, nitrogen and bacteria count on soybean Langdon, ND. *Bradyrhizobium japonicum* is often not present in the soil or present in such low numbers that yields are not maximized until bacteria populations increase. This study was initiated to evaluate management options that will maximize first year production to the producer.