Every year, producers throughout the U.S. and the world lose billions of dollars to disease. Plant pathologists and entomologists work to identify and control these diseases. NDSU’s North Dakota Agricultural Weather Network (NDAWN), in conjunction with the Small Grains Disease Forecasting Model, assist producers in making management decisions in disease conditions, such as outbreaks of fusarium head blight. Alarmingly, new diseases are entering the northern region as various cultural and climatic conditions change, and researchers actively monitor and research methods of early detection and control.

NDAWN and The Small Grains Disease Forecasting Web sites:
Estimated $34 Million saved/gained each year.

- This Web site has 15,000 to 20,000 hits during the two months that crops are most likely to be affected by disease.
- By predicting the likelihood of disease, showing where disease is occurring and the crop growth stage of development, the Web sites, using weather data provided by NDAWN, helps producers make informed decisions on whether to spray fungicides for disease management.
- Producers save money by not having to spray needlessly or gain income by spraying at the optimum time, ensuring high yields.
- The Web site was updated in 2008 to ensure easier access and usability. www.ndsu.edu/diseaseforecast

Soybean Cyst Nematode: New disease to ND

This nematode is recognized as one of the most problematic soybean diseases. It causes more than $1 billion in agricultural losses in the U.S. each year.

- Recently identified in Richland and Cass counties, it WILL spread to other soybean areas in the state.
- This disease is hard to identify because it can show little or no above-ground symptoms but results in major yield reductions.
- North Dakota farmers are not as familiar with the disease and may not recognize it until major damage has occurred.
- North Dakota conditions are suitable to the nematode reproductive cycle – the cold climate reduces predator attacks on eggs, increasing survival levels and disease.
- Control methods:
  - Using recently developed resistant cultivars suitable for northern U.S. regions
  - Sample soil to determine egg levels
  - Crop rotation to keep population levels low
  - Education to help producers understand and control the disease
- Soybeans are grown on almost 4 million acres in North Dakota.
Emerging disease problems

Ug99 - a new virulent wheat rust strain

Ug99 was first found in Uganda (Africa) in 1999 and has started to spread around the world. Recent experiences with other new rust diseases suggest a high probability that the disease will reach the United States soon.

- Spring wheats are more susceptible to Ug99 than are winter wheats produced in competing states such as Kansas meaning North Dakota would be at a competitive disadvantage were Ug99 to strike today.
- Most wheat cultivars grown in ND and breeding lines for future cultivars are fully susceptible to Ug99.
- In 1954 a serious stem rust epidemic claimed 40% of the U.S. wheat harvest.
- Ug99 has caused localized losses of 100%.
- Sources of genetic resistance need to be identified and incorporated into ND wheat breeding programs.

Zebra Chip: A new threat to the potato industry

A new potato disease called zebra chip (named for its pattern in the potato tuber) has spread rapidly in the U.S. during the past eight years and is looming close to North Dakota, particularly the western half.

- This disease has had a devastating effect in Texas, with estimates of 35% to 40% of potato acreage affected and a crop loss of approximately $25.9 million (2005 estimates).
- First found in Mexico in 1994 by NDSU scientist Gary Secor, the disease has, just this summer, been determined to be caused by a bacterium that is spread by a potato psyllid.
- This insect is spreading north following the path of trade winds, which are suspected of transporting the psyllid, and climate change assisting the ability of the insect to survive.
- Now that this has been identified, research can begin to investigate control methods.

Emerald Ash Borer

Although the Emerald Ash Borer is not present in North Dakota at this time, it has moved quickly through many states since being discovered in Detroit, Michigan in 2002 and has now located in Michigan, Illinois, Indiana, Maryland, Missouri, Ohio, Pennsylvania, Virginia, West Virginia and Wisconsin.

Although the beetle itself is not destructive, the larvae feed on the inner bark of ash trees and disrupt water and nutrient transport. It has killed tens of millions of ash trees and is a potential threat to North Dakotan trees.

Red dots on map show infested areas, white areas are State quarantine—generally infested areas. More information can be found at: www.emeraldashborer.info/