

## Department overview

12 Research and 5 Extension faculty.

- Faculty aligned with commodities, commodity groups, and breeding programs.
  - ◇ “One foot in the furrow and one foot in the lab.”
- Research and Extension activities on plant diseases of economic importance to the state.
  - ◇ Plant diseases and their management cost ND producers hundreds of millions of dollars per year, affect rotations, and can limit where crops are produced.
- Department is aligned with NDSU mission and goals.
  - ◇ Record graduate enrollment and contributions to R1 status while addressing ND plant disease problems.
- Plant Diagnostic Laboratory (including Seed Health Testing Laboratory) and Soil Testing Laboratory.
- Departmental work includes:
  - ◇ Original research on biology and management of plant diseases of economic importance.
  - ◇ Collaboration/cooperation with breeding programs, RECs, and commodity groups to develop disease-resistant germplasm and varieties.
  - ◇ Working with industry to: 1) develop effective and sustainable disease management tools for producers., and 2) develop public-private partnerships.

# NDSU PLANT PATHOLOGY

## New faculty



**Dr. Wade Webster**  
Extension soybean  
pathology



**Dr. Febina Mathew**  
AES soybean  
pathology



**Dr. Eric Branch**  
Extension sugarbeet  
pathology

## Challenges

### 1. Activities on Novel, Adaptive, & Re-emerging Pathogens

- Over 20 new diseases have arrived in ND since ca. 2000 (e.g., Soybean cyst nematode, clubroot, & Goss' wilt).
  - ◇ Others are knocking on the door (e.g., tar spot of corn and bacterial leaf streak of corn). Department is vigilant.
- Fungicide resistance in existing pathogens limiting input options and affecting fungicide rotations. The new field lab will greatly facilitate this work.
- New races and forms of existing pathogens are developing (e.g., new forms of soybean cyst nematode). Our eye on stem rust of wheat.

### 2. Field equipment

- Pathology field activities often best kept separate from breeding and agronomy activities.
- Soybean pathology has no dedicated field equipment for planting or harvesting.
- Broadleaf crop field equipment is decades old or fabricated from free parts (right). This planter has many shortcomings and is not suitable for yield determinations or other agronomic data.



Departmental “Franken-planter” pieced together with assorted parts.

## Challenges (continued)

### 3. Interaction of space and staff

- The department is based in Walster Hall (1960) so many labs are small and dated.
  - ◊ Plant Pathology space in Walster Hall at capacity.
  - ◊ New field lab will greatly increase capacity and help relieve space constraints.
  - ◊ Department envisions “clean lab” (Walster Hall) and “dirty lab” (new facility) space utilization.
- Department has limited expertise with non-fungal pathogen groups that are emerging in the state (bacteria, viruses, plasmodia, etc) and with emerging technologies (e.g., “omics” and big data).
  - ◊ Clear need for increasing bacteriology and virology and big data capabilities.
  - ◊ However, existing space is problematic and near-term opportunities for some redirection exist.
- Pulse pathology in particular is challenged with multiple crops and diseases over wide geographical areas makes it difficult to address all needs of producers and breeding programs,

### 4. Operating

- Inflation is impacting the costs in labor, graduate student stipends, and equipment and supplies.
- We are losing ground to many peer institutions that offer graduate student stipends up to 50% higher than ours. In addition, many of those institutions provide health insurance.

## Requests

### 1. Funding to the AES for major equipment purchases.

- Major purchases of field equipment for soybean and other broadleaf crops.
- Modern equipment for laboratories, including the new field lab.

### 2. Increased operating and graduate student support to AES.

- Assist Ag Administration with cost of operations for new field lab, greenhouses, and so forth.
- Offset the effects of inflation and help make stipends competitive.

### 3. Research specialist to assist field- and lab-based research activities on all pulse crops across ND.

- Pulse crop pathologist has responsibilities for diseases on four crops, two NDSU breeding programs, two multi-state commodity groups (Northarvest Bean Growers Association and Northern Pulse Growers Association) with activities from central Minnesota to Williston and further west.