Annual Report
Department of Plant Sciences

January 1, 2018
to
December 31, 2018

Thanks to Darin Eisinger for this drone video.

Sargent County Extension Field Day with Hans Kandel, Joel Ransom, Peder Schmitz, Darin Eisinger and Melissa Seykora at the Casey Decker farm in Gwinner, ND looking at soybean plots.
A. Significant departmental achievements in research, teaching and outreach during the past year.

a. Teaching

Students in the CFS 480/680 Food Product Development class were tasked with developing a blue cornmeal-based food product for their final project, including production and marketing plans, much like a commercial product development team. Dr. Jiajia Rao teaches the spring semester course. Richland Innovative Food Crops, Inc., located in Breckenridge, MN provided the cornmeal. Products produced by the class included *KT Lemon Cream Cookie*, *Blue Thunder Corn Flakes*, and *Blue Cranberry Bars*.

b. Research/Scholarly/Creative Activities

Dr. Berti’s forage crop research program conducts diverse studies in alfalfa harvest management and fertility. Her research has demonstrated that optimization of management and fertility practices can increase forage yield by at least 0.3 ton/acre/yr. Pure alfalfa acreage in ND in 2017 was 449,046 acres and alfalfa-grass mixtures was 962,015 acres. Thus, an increase in forage yield of 0.3 tons/acre/year x 1,411,062 acres (alfalfa & alfalfa-grass mixtures) @ $100/ton of hay equals an economic impact of $42,331,852/yr.

Based on the last three year’s average, North Dakota produced 55% (43.2 million bushels) of the durum in the United States with a $268M direct economic value to producers in North Dakota annually. Over 90% of the ND durum acreage is sown with varieties developed at NDSU. In 2018, Divide and the two new varieties, Carpio and Joppa collectively, were grown on 54% of the acreage in North Dakota. Two low Cadmium varieties, ND Grano and ND Riveland, with high yield potential were released in 2017. If the new varieties replace 50% of the acreage and provide 2% increase in yield, it will add approximately $2.7M annually to North Dakota producers.

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<thead>
<tr>
<th>Category</th>
<th>Total</th>
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<tbody>
<tr>
<td>Peer Reviewed Publications (published or accepted)</td>
<td>107</td>
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<tr>
<td>National or International Invited Presentations</td>
<td>102</td>
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<tr>
<td>Research Grants and Contracts (number that are active)</td>
<td>169</td>
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<tr>
<td>Cumulative Amount (total value of active grants and contracts):</td>
<td>$7,158,753</td>
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c. Extension/Outreach

NDSU Extension organized two, 1-day tile drainage design workshops in Fargo. Total registered attendance was 74. Workshop participants were asked to place a dollar figure on the knowledge received when applied to their business and the average estimated value was $22.12 per acre. All growers who answered the survey collectively farm a total of 176,800 acres, of which only 5% is tiled. If these participants tile 5% of their fields annually, the first-year benefit would be $195,000. In year 5, the annual benefit would be $970,000.

Dr. McGinnis is the Program Director of the NDSU Extension Master Gardener Program. Currently, we have approximately 200 active Master Gardeners in the state. These volunteers
design and maintain over 100 public gardens, give presentations, give media interviews, publish a newsletter, diagnose plant problems, collect and donate produce to food pantries, and conserve pollinator habitat. Between 2013 and 2017, Master Gardeners contributed 34,659 volunteer hours, which is valued at $863,206.

d. Service
Dr. Asunta (Susie) Thompson was among 11 women named in "The Potato Industry's All-Star Team" article in the May/June 2018 *Spudman Magazine* Women of the Industry issue. The article features some of the leading researchers, breeders and growers from across the U.S. and Canada.

NDDA Commissioner Doug Goehring presented Dr. Rod Lym with the 2018 Weed Control Partner Award. The award honors outstanding invasive weed control efforts in the state. Goehring said, “Dr. Lym has been a valuable resource for the latest research and information on noxious and invasive weeds and I thank him for his efforts.”

Dr. Joel Ransom received the 2018 United States Durum Growers Association Amber Award in November at the Crop Outlook and International Durum Forum in Minot. The Amber Award is given annually to an individual who has contributed significantly to the durum industry and producers.

B. Department goals and priorities for the past year, including narrative about progress toward those goals.
Work in the department continued on updating the curriculum and teaching assignments in plant breeding and genetics. With the hiring of the new pulse breeder, Dr. Nonoy Bandillo, we have been able to ensure that the classes currently taught by Dr. Helms will be taught following his retirement. Dr. Bandillo will teach PLSC 782 (Population and Quantitative Genetics) in spring 2021 and PLSC 751 (Advanced Genetics) in spring 2022.

The multi-year goal of increasing enrollment in the Horticulture and Food Science programs continues. This year we discussed with both programs the possibility of creating a new option in one or both of the options that includes topics in local and sustainable agriculture production, culinary agriculture, and a new food safety course. We think these options will help us to attract additional students.

C. Department challenges for the past year, including narrative on how those are being addressed.
The research and teaching facilities in Harris Hall continue to be in disrepair and it is not cost-effective to make most repairs or renovations. The support we have received from state commodity groups and the North Dakota legislature for a new Agricultural Product Development Center is encouraging.

D. Department goals and priorities for the coming year.
a. Work with the NDSU Development and Alumni Foundation in raising money for the Agricultural Product Development Center.
b. Bring modern data management methods to the department’s breeding programs.
c. Continue to work to increase enrollment in the Horticulture and Food Science programs.