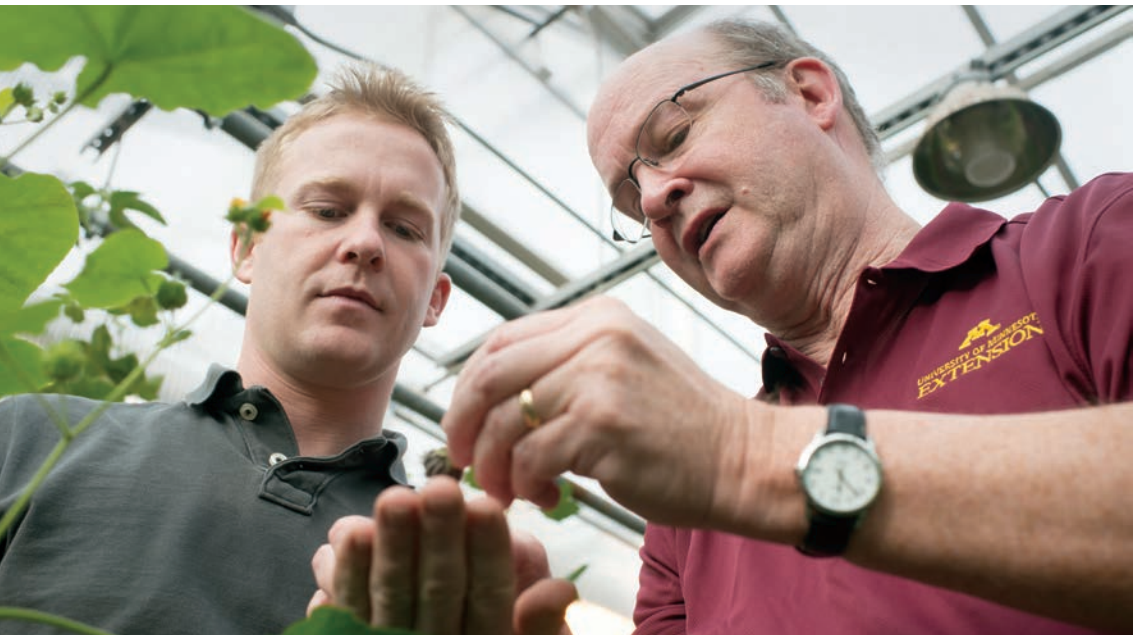
Meeting the challenges of today's agriculture

Modern farming is more complex than ever



Jeff Gunsolus, Extension weed scientist, updates Christian Lilienthal on herbicide-resistance research. Lilienthal is an Extension educator in Nicollet County who informs local farmers coping with the challenge.

Agriculture keeps advancing, adapting new technology to meet the needs of an increasingly global economy. Caring for the land, while ensuring that it continues to produce the food and energy needed for an estimated population of 9.6 billion by 2050, requires informed decisions. Extension helps agriculture producers make the best decisions based on the latest research.

Fields with ragweed and waterhemp plants, standing tall and green, remind Jeff Gunsolus of the stubborn nature of weeds. Many hoped planting genetically improved seeds would eliminate weed problems, but herbicide-resistance changed that.

"Weeds are adaptable," says Gunsolus, Extension weed scientist. "They develop genetic resistance when they are exposed to the same herbicide year after year."

CULTIVATING CROP SOLUTIONS

Extension research and education guides growers on how to cope with extreme weather, insects, weeds and diseases

SMALL GRAINS

Wheat, barley, oat, rye and triticale are some of the small grains grown in Minnesota. Since the mid-1990s, wheat yields in northwest Minnesota improved by about 1.6 bushels per acre per year, due in part to Extension research and guidance on varieties, protein content, strength, and management of diseases such as scab and leaf rust.

Gunsolus has devoted more than 30 years to long-term research into the complexities of weed control, providing data that show farmers how and why they need to diversify strategies to keep weeds from robbing yields.

Like other Extension researchers, Gunsolus works with regional and county-based Extension educators to ensure the latest research makes its way to the farmers who produce today's crops.

"We're in a different game now," says Extension educator Christian Lilienthal. "People in agriculture can't base this year's decisions on what they did last year." Lilienthal, who lives and works in Nicollet County, works with Gunsolus and other scientists to help local growers make good decisions in real time.

Facing complex issues

Water is a significant challenge in the complex industry of agriculture. Access to it is one issue. Keeping it clean is another.

Farmers need nitrogen and other nutrients in order to have fertile soils and healthy crops. Like all business owners, they want to operate at the top of their capacity, but they also want to be good stewards of the land. So they learn strategies from Extension to reduce negative impacts while maintaining optimum yields.

Precision agriculture is one growing area, with high-tech systems identifying nutrient needs precisely, so farmers can target rather than broadcast applications. New, innovative solutions are also generating interest, like buffers and other forms of conservation drainage that absorb nitrogen before it can enter bodies of water.

"It's never certain what challenges the next year will bring farmers," says Gunsolus, "but Extension is always ready to work with farmers for the best outcome for both land and business."

From horses to high-tech

Farmers controlled weeds with horse-drawn cultivators in 1914 when Congress passed the Smith-Lever Act that created Extension federally. (University of Minnesota was ahead of the curve, creating Extension in 1909.)

Bert Enestvedt, whose grandfather farmed with horses and oxen, was born six years after national Extension was created. Extension bulletins dating back to 1914 are stored in the family archives, evidence of the research Extension made available to the Enestvedts and other farmers across the state.

"Extension has always been concerned with agriculture and a respected authority," says Enestvedt, a founding director of the Minnesota Soybean Growers Association. "The University was often almost our sole source of information."

Enestvedt has since lived to see his family's Sacred Heart land farmed with tech-guided tractors. Advanced machinery is needed for farmers to be able to feed an estimated 9.6 billion people in 2050. Extension continues to study new technology and help the Enestvedts and other farmers decide how to apply it on the farm.

In 2014, we celebrate the Smith-Lever Act, which established the Cooperative Extension Service, a partnership between the U.S. Dept. of Agriculture and land-grant universities that extends research-based knowledge through outreach education.

CANOLA

Minnesota canola was on a downward trend for many years when growers couldn't achieve profitable yields. Now, Extension plant pathologist Madeleine Smith partners across the region to address issues like yield-robbing white mold and flood damage. She says Minnesota can compete in the growing marketplace for the healthy oil canola produces.

POTATOES

The heavy black soil of Minnesota's Red River Valley makes this region the nation's top red-potato producer. In the lakes regions, fertile sandy soils grow potatoes used for baking, fries and chips. Because potatoes are sensitive to herbicides sprayed on neighboring fields, Extension potato agronomist Andy Robinson is researching how to minimize exposure.

FRUIT AND VEGETABLES

Minnesotans have increased access to fresh, local vegetables in recent years, thanks to season-extending technologies such as high tunnels. Extension conducts research in 15 University high tunnels and with 21 growers. Integrated pest management strategies inform those growers, as well as fruit orchardists and producers of peas, beans and sweet corn.