LANTMÄNNEN
RESEARCH FOUNDATION

Call text – Agriculture and machinery 2024

The overall goal of the Lantmännen Research Foundation is to support the development of profitable and sustainable crop cultivation and animal production. Ongoing climate change and a turbulent world situation emphasise the need for a well-functioning food production sector from field to fork. It also includes issues such as energy supply, digital infrastructure, climate adaptation as well as effective consulting services and other systems to transfer knowledge from research to practice.

We believe that collaboration is a key factor in successfully overcoming today's challenges. We are therefore open to applicants contacting us to discuss the possibilities of using Lantmännen's feeds, seeds, experimental facilities and other resources in projects being planned. For example, Lantmännen has extensive research activities in feed and plant breeding where various ideas can be studied cost efficiently with excellent data quality.

Sustainable intensification of crop production

Agriculture needs robust cropping systems with high productivity under changing weather and climate conditions. Different cultivation measures and inputs also need to be assessed with regards to climate impact and other aspects of sustainability. Certain measures can drastically increase yields but may also result in new problems. For example, cropping systems dominated by autumn-sown crops give high productivity but also new weed and pesticide problems which we must learn to manage.

Current research areas:

- Precision agriculture and digitisation that improve yield, quality and sustainability for all crops. A particular priority is the optimisation of plant nutrition, seed quantity and plant protection with a focus on ease of use for advisers and farmers.
- The carbon balance of arable soils and nitrous oxide emissions with the focus on Nordic conditions and practical/economic possibilities.
- Robust crop rotation schemes and cultivation systems that can handle both surpluses and deficits of water, as well as milder winters in north Sweden with increased risk of damage due to ice cover.
- New methods and products that can supplement or replace traditional plant protection products.
- Genetic markers, advanced image analysis and other methods that can make plant breeding more efficient. New breeding goals, for example heat tolerance and persistence to damage from ice cover, may require development of completely new methodology.
- Fast and accurate analysis for, for example, viability, health and weed-seed contamination in seed with a focus on winter cereal grain.
- Fertilisers and lime that are efficient, sustainable and preferably produced in circular systems.
- Methods and strategies for managing new weed species and higher weed pressure, especially in forage seed production.
- Forage production and pasture ley for paddocks, with a special focus on horses.

Right quality of grains and other plant-based commodities

A prerequisite for profitable production and processing of grains and other plant-based commodities is that the quality specifications demanded are met. Different customers and different application areas impose different quality standards on these commodities. Sustainable grain management means ensuring the grain's quality without drying, cooling and cleaning more than is necessary. All unnecessary measures hit the grain grower's finances hard. Climate change with warmer autumns enables less need for grain drying but this in turn can increase the risk of attack by various storage pests and other problems.

Current research areas:

- The influence of cultivation measures on quality parameters required in different grain processing facilities e.g. protein content, amino acid composition, starch content, falling number and kernel size. For example, malting barley must have high viability and minimal husk damage, and oats should have a pale colour.
- The influence of grain properties on feed efficiency and in industrial processes. An example is the gluten yield in wheat, where grain batches with similar analysis values can give very different results and profitability.
- Cultivation and handling methods that minimise the content of unwanted substances such as heavy metals and fungal toxins. Strong focus on substances where maximum limit levels have been lowered or will be lowered.
- Energy-efficient drying and control of the drying process to reach the optimal target water content. Safe buffer storage before drying and efficient cooling.
- Monitoring systems to detect negative processes atgrain storage that negatively affect various quality parameters, for example germination in malting barley.
- Cost-effective and fast analytical methods, both qualitative and quantitative, for grains and other vegetable raw materials.
- Sorting and separation of different grain qualities for increased value. Methods and algorithms for online sorting with desired grain qualities in focus.

Profitable and sustainable intensification of Swedish livestock production

An expansive livestock production is important for a sustainable food supply. Detailed information on the animal's nutritional needs and on physiological processes in the body must go hand in hand with the genetic progress for production potential. Digital, technical and biotechnological development is also needed to find new solutions and approaches for a sustainable and circular livestock production.

Current research areas:

- Models for feeding recommendations that include both effective nutritional supply and climate efficiency for high-producing animals under Swedish conditions. Methane-reducing measures are a priority.
- The lifespan of productive livestock with a focus on sustainable and climate-smart production with high standards of animal health. The subject also includes bone health in fast-growing production and recruitment animals as well as causal relationships between nutrition, management and production losses.
- Feed evaluation for Swedish-grown crops, side streams from industrial processes and other raw materials that can be upcycled into feed. It concerns, for example, energy evaluation, fibre quality, protein quality, amino acid composition, mineral and trace element content.
- The influence of feed raw materials, feed additives and feed ration on the intestinal flora and further the influence of the intestinal flora on processes in the body and the animal’s production capacity.
- The animals' specific need for fat. This applies to fatty acid composition, fat quality, any impact on the end product as well as the development of feed fat that is produced from raw materials with a strong sustainability profile.
- Process technology at feed production for increased energy efficiency. Parameters such as milling structure and pellet quality are examples of important factors.