

## Call text – Agriculture and machinery 2023

An important objective of the Lantmännen Research Foundation is to support the development of profitable and sustainable crop cultivation and animal production. Ongoing climate changes 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. The Foundation's specific priorities are described below.

We see favourable that applicants contact us to discuss possibilities to use 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.

Read more about how we can cooperate to promote sustainable agriculture through research, innovation and practical on-farm measures:

<https://www.lantmannen.com/farming-of-the-future/farming-of-the-future-the-report/>

### Sustainable intensification of crop production



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

Current research areas:

- Precision agriculture and digitization that improve both yield, quality and sustainability for all crops. Special 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.
- New methods and products that can supplement or replace traditional plant protection products.
- Genetic markers, advanced imaging and other methods that can make plant breeding more efficient. New breeding goals, for example heat tolerance and ice burn tolerance, may require the development of completely new methodology.
- Fast and accurate analysis for, for example, vitality, soundness and purity in seed with a focus on winter cereal grain.
- Fertilizers and lime that are efficient, environmentally friendly and preferably produced in circular systems.
- Silage preservation methods that can increase feed quality and reduce waste.

### 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 protein content, amino acid composition, starch content, falling number and kernel size. For example, malt grains must have high vitality and minimal husk damage, and oats should have a pale colour. Special quality parameters also apply to special crops such as peas, lentils and beans.
- The influence of grain properties on yield in animal feed and in industrial processes. One example is the gluten yield in wheat, where grain lots with similar analysis values can give very different results and thus economics.
- Cultivation and handling methods that minimise the content of unwanted substances such as cadmium and fungal toxins.
- Energy-efficient drying and control of the drying process to reach the optimal target water content.
- Monitoring system to detect negative processes in the grain stores that negatively affect various quality parameters, for example germination in malt grains.
- Cost-effective and fast analytical techniques, both qualitative and quantitative, for grains and other vegetable crops.
- Methods and algorithms for online sorting with respect to desired grain qualities.

### **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 that occurs continuously. Digital, technical and biotechnological development is also needed to find new solutions and approaches for a sustainable and circular livestock production.

Current research areas:

- Bone health in fast-growing production and recruitment animals. Find causal relationships between nutrition, management and production losses.
- The lifespan of productive livestock with a focus on sustainable and climate-smart animal production. Applies to all food-producing animals.
- Feed evaluation for grain, pasture products, side streams from industrial processes and other commodities, which can be converted into food via animal production. It is, for example, about energy evaluation, fibre quality, protein quality, amino acid composition, mineral and trace element supply.
- The influence of feed raw materials, feed additives and diet composition, on the intestinal flora and further the influence of the intestinal flora on processes in the body.
- The importance and function of the intestinal flora and how it can be influenced to improve animal health and production potential.
- 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 for energy saving and to increase the use of domestic alternative feed raw materials.