Let's make grain great again

The Landrace

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General assembly in Landsorten

Landsorten will hold the annual general assembly the 8th February 2023 at Bråskovgård Efterskole. Apart form the ordinary agenda with accounting, budget and election for the board, we will also discuss how the organisation improve the work with the varieties among members, and how the organisation will further develop.

Bråskovgård Efterskole is one the seed producers of Landsorten, and they grows many of Lansortens's varieties. We shall see how they ensure the seed quality in particular when working with minor seed lots.

In connection with the GA, Ib Borup Pedersen will tell about regenerative farming as an extension of organic farming. Ib is farm manager and teacher at Bråskovgård Efterskole and is as the first Dane educated as consultant within the Soil Food Web following the system developed by Elaine Ingham.

Nordic Heritage grain days 2023

The annual meeting among Nordic grain enthusiasts is organised at Järna in Sweden 26th-28th June. It will be an orgy of novel knowledge and inspiration regarding ancient and organic grains.

The annual grain gatherings started in 2008, and is a fantastic opportunity to develop your network and get inspiration for your work with grain. Usually, a broad mixture of farmers, millers, bakers, researchers and many more who work professionally with grains in one way or another.

Looking forward to meeting you there!

Rusty wheat

Rust diseases are among the most wide spread diseases in agricultural crops. It is a group of diseases that are highly specialised to survive and spread on living plants. In wheat, the most frequent rust disease in our climate is yellow rust, which for the past decade has made much damage in wheat, and it is also the cause of most of the fungicide use in conventional farming.

Basically, there are two kind of diseases. One group is the specialised pathogens who can only survive in living organisms, while the other group are saprophytes that live from breaking down dead organic matter. But then there is also a third group somewhere the two others who can survive on dying or weakened plants, but who cannot attack healthy plant tissue. The specialised pathogens as no problems infection healthy plants, and often the thrive particularly well on well nourished plants who has the nutrients and water to nourish the pathogen to develop and spread their spores to the surroundings. Therefore, they are often the cause of the worst epidemics. Saprophytes often thrive on the lower leaves who gets the least sunlight and are weakened.

Rust diseases are the core concept of specialised pathogens. They spread epidemically monocultures and other plant populations with a lack of genetic diversity, and in particular in agricultural crops.

The strategy to control specialised pathogens and facultative saprophytes are different. It is difficult and some time impossible to develop effective resistance against saprophytes. Instead, these diseases should be controlled by making good growing conditions for the plants with nutrition, water, plant spacing etc. There are often differences in susceptibility amongst varieties, but generally it relies on many different genes, each adding a little contribution to the resistance. Specialised pathogens can often be controlled by a single resistance gene giving either full control or no control at all depending on the virulence race of the pathogen.

A lot has been done to breed wheat varieties with resistance to yellow rust in the past century, and the work is actually easily done. Every year, the yellow rust comes with the wind, so selecting plants that does not become infected is an easy way of finding breeding lines that are resistant to the dominating races. The only problem is that the races may change in the years to come if the resistance you have is the same as in the dominating varieties in the region. In that case, the pathogen will change and adapt to the varieties and resistance genes within them and develop new races. This happens often several times within a decade, and farmers therefore have to change to varieties with new resistance genes.

In Agrologica and Landsorten we are thrilled with populations and variety mixtures. With a broad genetic diversity, epidemics have difficulty to spread, because neighbouring plants all have different resistance genes, and the specialised pathogens are unable to infect all plants within a crop. The effect of diversity is less effective against facultative saprophytes such as fusarium and septoria diseases.

About a century ago, stem rust was the dominating disease in wheat in Northern Europe. Norman Borlaug was the front figure in the Green Revolution promoting industrialisation of agriculture in the developing countries, and is one of the major achievements was the introduktion of the gene Sr31 in wheat which gives resistance to stem rust. Because of this gene, we haven’t seen this disease in our region for a long time. However, during the past decades, the disease developed new pathotypes virulent to the Sr31 gene, and it is spreading in Africa, Asia and is now also found some places in Europe including countries as far north as Sweden and England. There is therefore a risk that it will return as a major disease also in Northern Europe. We fear that because if it comes, we are pretty badly prepared for it, as we don’t know if our varieties have any resistance when the global epidemic hits.

Novel project on stem rust

Along with Århus University, Agrologica will in the coming two years test if the varieties in Agrologica's breeding program have any of the known resistance genes known against stem rust. This will be done with genetic markers and by green house testing under controlled environmental condition in the quarantine facilities at Flakkebjerg research centre. We will also test if we can identify germplasm from genebanks and elsewhere to identify lines with resistance genes that can be incorporated into moderns advanced breeding material.

The project "Resistance against the devastating fungal disease stem rust in organic wheat" will get financial support form the Organic Farming Foundation 2022-23 from the program for plant based food, and we are looking forward to getting started.

Landsorten on tour

Landsorten and its members share a common goal of increasing the diversity of grain in both the fields and in the stomachs. Therefore, the employees of Landsorten visited some of the members during the year to discuss how we can support each other. Several places, we held common workshops, meetings and events for the members and their costumers and business partners.

If you wish to see us or have a proposal for an event, please do not hesitate to contact us. We love talking about grain!

Figur 1: Landsorten visiting Quartz Mill 18/11-2022

New organic plant breeding station

Agrologica started plant breeding 15 years ago, and in many ways it is going well. We get lots of exciting cereals made, and Landsorten's members are happy with them. In the future, we will hopefully have to eat more plant-based, and then it will no longer work with just eating potatoes and bread. We need to eat far more divers food to achieve the same food pleasure from a plant-based meal as you get through a meat-based diet.

In Denmark, only cereals, potatoes and grassland plants are bred. Plant varieties of virtually all other crops comes from other parts of Europe or the world with a different

Figur 2: Agrologica need more space, manpower and investment in order to cope with the innovation potential.

climate and food culture, and the vast majority of plant breeding takes place under conventional conditions and aimed for conventional agriculture. When we look at how big a difference there is between Agrologica's varieties and the conventional varieties within cereals, it shows a crying need to develop new varieties within a wide range of crops. That task is too big for a small company like Agrologica to take on. On background, Agrologica and Landsorten have assessed that there is a need for new investments to establish an actual organic plant breeding station, with the knowledge, manpower and physical facilities to expand far beyond what can be accommodated in Agrologica's narrow framework. The Foundation for Organic Agriculture agrees with the vision, and has therefore granted a feasibility study that can thoroughly analyze the situation and potential and create a business plan to realize the vision for an organic plant breeding station. The study will be made in cooperation between Agrologica, Landsorten and Rousing Consult, bit more people will be invited to contribute to the analysis.

Contact us if you have an opinion about it, or think you can contribute in one way or another. Are you our next employee if it succeeds?

Seed is a human right

Yes, you read that right. Access to seed is a human right guaranteed by UN conventions. This has turned out to be a central argument in relation to ensuring diversity in the fields and in the kitchens.

Access to food is guaranteed as a human right in the UN Declaration of Human Rights Article 11.1 and 11.2. The declaration says that no may not prevent other people from being able to get food. This also applies to national legislation, because all UN memberships countries agree that human rights are legally above national legislation. It is thus violating human rights if a country introduces a law that allows torture, and it is also violating human rights if a country introduces a law that in practice prevents a human population from having access to food.

70% of the global food production comes from local self-sufficiency. It may be hard to imagine when we look at modern industrialized agriculture in Europe, but that is actually how it is. Globally, it is therefore absolutely crucial for human access to food to ensure local self-sufficiency, and access to seed is a key prerequisite for people to be able to produce local food. The UN has therefore written an entire human rights declaration called UNDROP (United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas), which specifically deals with the rights of peasants. Chapter 19 of UNDROP deals specifically with access to seed and here it is so clear that it cannot be misunderstood that farmers have the right to produce their own seed and to sell these seed to each other. It is a UN adopted human right and it is not up for debate. On top of that, it is explicitly stated that national legislation must not violate this in favour of commercial interests.

The international Plant Treaty ITPGRFA (International Treaty on Plant Genetic Resources for Food and Agriculture), which Denmark and the EU have adopted, is not an expression of human rights, but rather of the Biodiversity Convention. In the Plant Treaty, the farmers' right to use and sell seed is also guaranteed quite explicitly in Chapter 9. In the Plant Treaty, the right is not secured with reference to access to food, but for the sake of securing agrobiodiversity and the preservation of the biological diversity of cultivated plants, because it is recognized that the increasing commercialization of the seed industry has a negative impact on the diversity of cultivated plants and the food developed thereof.

It is thus absolutely unequivocally guaranteed that farmers worldwide have a secured right to produce, buy and sell seed to each other, because otherwise many people must go to bed hungry and we will lose biological diversity.

In the Danish seed legislation, which is an embodiment of the EU's seed directive, there is no prohibition against using home saved seed, nor against selling seed. So far so good. But, there is a general requirement that if it is sold, it must be certified, and one of the requirements for seed certification is that the variety is adopted and listed in the EU's catalogue of approved varieties. Variety approval and certification must ensure that the variety is well tested and the seed controlled so that the buyer gets what he expects. However, there are some exceptions where certification is not necessary.

Seed legislation has a different purpose than human rights and biological diversity, namely to ensure a good quality of seed in order to ensure agricultural production both quantitatively and qualitatively, both for the individual farmer and for the EU's agricultural production as a whole.

In Landsorten, many farmers use their own seed, and many buy and sell seed with each other, which is not certified. One may therefore doubt whether this is a guaranteed human right and a noble deed to safeguard the agro-biological diversity, or whether it is a criminal act in violation of applicable laws. To remove any doubt, Landsorten has discussed the various rules and treaties with the Danish Agency for Agriculture, which is the Danish authority that administer both the Plant Treaty and the EU Seed Directive at the same time. It has been a very fruitful dialogue for both parties, and we have agreed on how we can balance on the knife's edge between the two sets of rules without coming into conflict with either one nor the other.

What we have agreed upon is among others:

- Seed may be traded from farmer to farmer without being certified if it is sold in limited quantities for the purpose of testing new varieties within production. A mill or a farmer can therefore buy un-certified seed if the purpose is to test whether this variety fits into the production. In Article 3 in the EU Seed Directive, it clearly says that the certification requirment does not apply to test and research, so it is not violating the directive.
- If large quantities of seed is traded of a variety, which are already well known to the buyers, then this cannot be called testing, and then the seed must be registered as either a conservation variety or as Organic Heterogeneous Material or in some other way. There are special rules that make this possible within the new organic legislation. Popkorn and Mariagertoba, for example, are now sold in such large quantities that we have agreed with the Danish Agency for Agriculture that it is relevant to have these populations registered as Organic Heterogeneous Material and to have the seed production approved.
- Landsorten must try to ensure that the seed trade that takes place between farmers, as far as possible, complies with the seed legislation's purpose of ensuring seed quality.

It is on this background that Landsorten has published a pamphlet which describes our seed system in detail. So it is not entirely coincidental what is written in the pamphlet. It is actually the result of a very careful analysis of what is both possible and legal, and taking into account the various purposes that the legislation and treaties must fulfil.

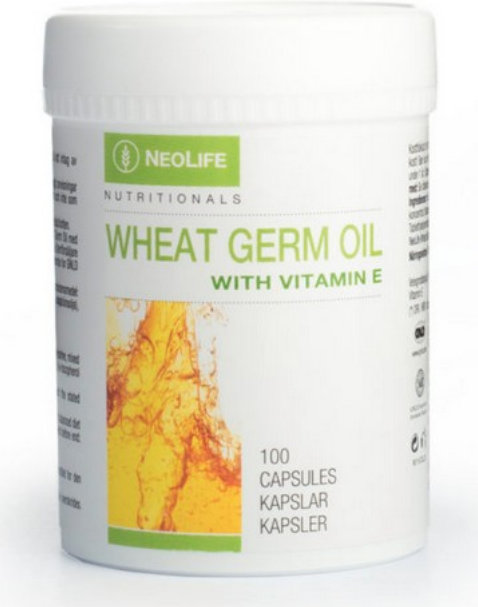
In this way, we believe we have solved the Gordian knot that is evident between the EU seed directives and the international treaties and declarations. So we are in some way allowed to have our cake, as long as we don’t eat it all.

AMD - preserve your sight with grain

Our vision decreases with age. It cannot be avoided, but we can do something to delay the process. Avoid smoking and exercise! It is always good and works against most ailments, also in relation to vision.

At the age of 75 and over, about 10% of the population has been diagnosed with reduced vision due to AMD (Age-related Macular Degeneration), and once you have it, there is no treatment that can restore the reduced vision. Already at the age of 30-60, 14% of the population has drusen and pigmentation in the retina as signs of incipient age-related deterioration, which will eventually develop into AMD. It is only a matter of when and if the patient has a lifestyle and gets old enough for it to become a problem.

The formed pigmentations, which can lead to AMD in the eye, are due to oxidation as a result of waste residues in the eye, and they can only be prevented with antioxidants, which are either formed by the body itself through a healthy lifestyle, or through the diet. In the diet, it is especially vitamins E and C, the mineral zinc and the two very closely related antioxidants lutein and zeaxanthin, which are known to have an effect on preventing AMD. Lutein and zeaxanthin are precursors to vitamin A. It is therefore important to eat healthily and ensure an ample supply of these substances in the diet.



Figur 3: Example of a Vitamin E supplement made from the wheat germ that is sifted from flour.

In our part of the world, we get a large proportion of our zinc from bread and other grain products, but unfortunately most of the zinc in grain is located in the bran layer of the kernel, which is sifted from white wheat flour. Whole grain flour contains a lot of zinc, but the zinc in grains is bound in phytate, so monogastric animals including humans cannot absorb the zinc unless the phytate is broken down first, and this takes time. It is therefore absolutely essential for the supply of minerals that bread is left to rise and other cereal products are soaked for at least 4-6 hours, because otherwise we cannot absorb the minerals. In an industrial bread from the supermarket, the bread has often only risen for less than 1 hour before baking, and that is not enough to break down phytate and thus ensure the supply of zinc and other minerals from the food.

The WHO estimates that 56% of the world's children are under-supplied with zinc, iron and vitamin A, and around 1 billion people in the world have visible symptoms of zinc deficiency. This is also pronounced in the western part of the world. In the 30 richest countries in the world, 30 million children are estimated to suffer from zinc deficiency. A lack of zinc goes together with a lack of vitamin A and iron under the term "the hidden hunger" and in our part of the world is mainly due to excessive sifting of the flour and too short a rising time in the bakeries. No thanks to fast food!

Grain contains huge amounts of vitamin E in the germ and could remedy the problem, but the germ is sifted together with the bran from white wheat flour. Although vitamin E remains in the flour in wholemeal flour and light-sifted flour, vitamin E is quite volatile, and already after 2-3 months, the content of vitamin E in flour is halved compared to freshly milled flour. Most flour is sold in supermarkets with a shelf life of 12 months, so there is virtually no vitamin E left in the product if it has been left for a long time in the store or in the kitchen drawer.

Although our huge the grain concumption creates a problem with our nutrition, the grain can also be the salvation, because the grain contains everything that we lack. We just have to treat it properly. On this background, I have developed the wheat variety that I call Sun Shine Wheat.

Sun Shine Wheat has a high content of lutein, which is the antioxidant that can prevent AMD. Sun Shine Wheat also has a very low content of polyphenols in the bran, and it is the polyphenols that is responsible for the bitter taste and make wholemeal flour dark. Therefore, it will be possible to make whole grain flour from Sun Shine Wheat, which resamples sifted flour, without consumers to the same extent opting out of the product because of the taste or appearance.

Lutein is yellow, so the flour from Sun Shine Wheat is yellowish compared to ordinary wheat varieties that produce white flour. It is also lutein that gives spaghetti its appetizing yellowish colour, as most varieties of durum wheat also contain lutein. Einkorn also contains large amounts of lutein.

Figur 4: Why bye synthetic supplements, when you can get it all from a healthy diet?

Sun Shine Wheat is therefore specially developed to be used for wholemeal flour and to prevent AMD, but it can also be used for other purposes. It has a high protein content and a good baking quality, but the high content of lutein is actually also relevant as chicken feed. Hens are often fed some maize, which contains the closely related zeaxanthin to give the yolk its yellow colour, but the higher protein content of Sun Shine Wheat can reduce the need for supplemental feeding of soy and other legumes to compensate for the lower protein content of maize. Therefore, Sun Shine Wheat will be a good feed for laying hens. Win-win.

Regenerative farming

The current chairman of ICROFS, Jørn Jespersen, was the first Danish politician who, in the election campaign for the parliamentary elections in 1987, made it a point in his campaign to promote organic agriculture. It was an icebreaker at the time that organic farming could be perceived in the public space as so important that a politician would use his election posters on it, and on top of that, was elected to the The Danish Parliament on it.

Today, it is completely political uncontroversial to support organic farming. No politician in any party has any objection to the fact that we have organic agriculture in Denmark, and if you look in a newspaper for sale offers, you almost get the mistaken impression that organic production constitutes a significant part of Danish agriculture, even though the statistics show that around 90% still cultivated with pesticides and fertilizers almost ad libitum.

At the parliamentary elections in 2022, the Danish politician Franciska Rosenkilde campaigned for regenerative agriculture. Again, this is a politician who in the election campaign uses a word and a concept that very few voters basically know what actually means. It is therefore worth taking a closer look at the term, even though Franciska Rosenkilde has ended up in a peripheral opposition role after the election.

Where organic agriculture was developed in the 1980s as a reaction to the unregulated pollution with nitrogen and the increasing consumption of pesticides, regenerative agriculture has arisen in the wake of the climate and biodiversity crisis, and in recognition that large parts of organic

agriculture do not develop itself in step with the environmental challenges of the time. Whereas organic and biodynamic farming has been talking about the value of compost and soil fertility since the 1930s without really living it up in practice, regenerative farming goes to work with spades and microscopes to monitor the soil's fertility and adjust agricultural production precisely with this in focus.

The theory behind regenerative is the significance of fungi in the soil. When an old forest can continue to grow without supplemental nutrition, it is because the micro-life in a forest floor in an old forest is dominated by fungi. Agricultural land, on the other hand, is dominated by bacteria, and therefore agricultural land needs a constant supply of nutrients to maintain production. Mushrooms and fungi do not tolerate tillage, monoculture, fertilizers and pesticides very well, so the common agricultural practice constantly inhibits the growth of the fungi in relation to the bacteria in the soil. This is of decisive importance for the soil's humus content and fertility.

The general agricultural practices, and also large parts of the organic agricultural practices, therefore eat away at the soil's humus content, and impair future opportunities for food production. Humus is absolutely essential for both the microclimate in the soil and for the macroclimate on the globe.

Only fungi can form stable humus. Bacteria cannot do that. You can plow endless amounts of straw and other organic matter into the soil, but if it is dominated by bacteria, then the organic matter will simply be converted into heat, water and CO_2. A part of the organic matter, on the other hand, will be converted to humus if it is converted by fungi. Thereby, the soil in a fungus-dominated soil constitutes a stable carbon store, which both counteracts climate change and at the same time improves soil fertility and future food production.

In order to promote a fungus-dominated soil, regenerative farming encourage to reduce soil tillage and the addition of uncomposted manure and other bacteria-containing fertilizers and other things that inhibit the growth of fungi in the soil. In addition, the soil is inoculated with compost tea and the like in the places in the crop rotation where the fungi have good growth conditions. Fungi in the soil live for a large part of root exudates, which are secreted from the plants. Different plants species secrete different amounts and types of root exudates, and different fungi have preferences for different plant species.

As in other biological systems, biomass production increases with increasing biological diversity, and the more plant species that are grown together, the more fungal growth there will be in the soil. Conversely, a bare soil without plants will be very harmful to soil fungal life, especially those species that live in direct symbiosis with plant roots. Permanent plant cover and polycultures in favor of monocultures are therefore very important elements in regenerative agriculture.

The soil contains immeasurable amounts of nutrients. For example, there is often around 10 tonnes of N/ha, so it is not because the soil should not be able to provide nutrients for plant growth. The problem is just that the plants and bacteria are not efficient enough to absorb the nutrients. It is only fungi that, with their long hyphae, get so far into the soil that they can get hold of the nutrients, which are bound in humus and clay colloids, and transport them to the plant roots. The fungi are therefore important both for the long-term humus build-up in relation to climate and fertility, and also for the short-term plant growth in the individual growing season.

I don't know much about regenerative agriculture, so I will stop here and look forward to the general assembly in Landsorten, where we will also have the opportunity to hear a little more about the topic.

Seed for spring sowing 2023

Landsorten is again offering seeds of different varieties this season, and there are still seeds left of some of the varieties. If you want to bye seed of any of the varieties, please contact our seed coodinator Bjarne Hansen (bjarne@landsorten.dk) who will forward your request to the nearest producer of the variety you need.

Wheat

Mariagertoba

Mariagertoba has been well received by a number of organic mills due to the baking quality. Mariagertoba is a mixture of many different breeding lines, which together provide the fine baking quality and cultivation reliability. The mixture is approved as Organic Heterogeneous Material, and is thus freely traded. Mariagertoba is grown by Landsorten members in Denmark, Norway, Belgium, the Netherlands, Germany and England.

Sun Shine Wheat

As described above, Sun Shine Wheat is a spring wheat that produces yellow flour. The yellow colour is due to a high content of lutein, which is a healthy antioxidant that, like beta-carotene in carrots, prevents eye diseases, as it is a precursor to vitamin A. Sun Shine Wheat has a hard light kernel, reminiscent of durum wheat in that way, but unlike durum, Sun Shine Wheat has an elastic dough, which is better suited for bread baking.

Cadenza - allergy-friendly

Among all of the varieties so far studied, Cadenza is the wheat variety that has the lowest content of α-9 and α-20 gliadin, which are some of the proteins that cause the biggest problems with gluten intolerance and celiac disease. Cadenza may therefore be less harmful for some patients who have problems with gluten. However, it is important to emphasize that not all gluten-allergic or celiac patients will be able to tolerate Cadenza, as it is not a gluten-free wheat variety. Cadenza is not found in any genebanks, and Landsorten has, after painstaking digging, propagated the variety from a few seeds we had access to. The Landsorten portion of Cadenza is therefore perhaps the only one available, and it is still not very large. Cadenza is a facultative wheat that can be grown both as spring wheat and as winter wheat. The variety was widely grown in both England and Denmark back in the 1990s.

Durum wheat

Durum-wheat is mainly grown in Italy and other warm arid countries, where it is used for e.g. pasta, bulgur and couscous. This is because Durum-wheat, with its very hard kernel, can better produce

simulina and broken kernels, while the ordinary, softer kernel in common bread wheat is more suitible for flour.

The Landsorten's Durum-wheat is suitable for the Northern European climate and is tall and matures at the same time as ordinary spring wheat. Durum wheat sets less tillers compared with bread wheat, so it is recommended to increase the seeding rate to improve weed competition.

Blue spring wheat

Blue spring wheat has kernels that are bright blue. It looks interesting in a salad bowl. Blue wheat flour gives a bread color reminiscent of rye bread.

Purple spring wheat

Purple wheat is a good supplement to common wheat in your flour portfolio. In purple wheat, the coloring matter is in the bran, so purple wheat does not make much sense if the goal is to make sifted flour. On the other hand, the purple bran can be used as a natural coloring agent for other foods, and it is already used in beer brewing for this purpose.

Original Danish spelt

Most varieties of spelt have their origin in other countries, but Landsorten is the only one to present a spelt variety that has traditionally been grown in Denmark. The variety can be grown both as winter spelt and as spring spelt.

Indian Dwarf Wheat

Indian Dwarf Wheat is a special type of grain that is very closely related to common bread wheat and spelt. However, the kernels are quite small, only half the size of bread wheat. For regular bread baking it is not so good, but it is excellent for pizza and fun to have in a salad bowl. Indian Dwarf Wheat has a high protein content, and with its small kernels may be relevant to use as chicken feed.

Allergy-friendly spelt

Landsorten has got hold of a spelt variety E3 that has a mutation that makes it free from expansin. Expansin is the protein that can cause hay fever (grass pollen allergy) and can also cause wheat/food allergies. E3-spelt also has a low content of fructan, which around 11% of the population have problems digesting. E3-spelt can therefore be a solution for some consumers who have problems eating regular wheat bread made from modern varieties.

Xinchang Rice (spring wheat)

Xinchang Rice is not a rice but a wheat species that looks a little special, and in fact, like Indian Short Wheat, it is a completely different species from common wheat, although they are closely related. It is almost a kind of naked spelt, i.e. a type of grain that, like common wheat, does not need to be de-hulled, but which nevertheless has characters reminiscent of spelt. A curiosity for those who want something that no one else has. Xinchang Rice has cultivation characteristics similar to ordinary wheat with a decent yield and usable baking quality.

Mary triticale

Landsorten's triticale variety comes from Tasmania, and is therefore named after the Danish Crown Princess Mary, who also comes from there. Triticale is a cross between wheat and rye, and triticale is also in many ways a mixture of characteristics from both wheat and rye. Most triticale is used in Denmark for feed, but you can bake bread from triticale. This gives a bread that is a bit like rye bread, where a little wheat flour has been mixed into the dough to improve the leavening ability. The taste is slightly milder than real rye. Landsorten's variety Mary triticale has been cultivated in Denmark since 2018, and has not yet been seriously attacked by yellow rust, which is otherwise the most feared disease in triticale. Mary triticale can be grown both as spring triticale and as winter triticale in our climate.

Barley

Naked barley

Landsorten offers a naked barley from the German biodynamic plant breeder Cultivari. The variety has very good weed competition, and the kernels are beautiful and bright. With its high content of beta-glucan, barley is a healthy food that we should use much more. Naked barley was, together with emmer, the most widespread cereal crop in the Stone Age.

It is not only humans who could benefit from increased use of naked barley. Naked barley is well suited as chicken feed and for other feed purposes where a higher digestibility is desired compared to ordinary spring barley.

Amylina naked barley

Amylina-byg is a naked barley from the German biodynamic plant breeder Cultivari, which has a high content of amylose.

Most of a grain kernel consists of starch, and the starch itself consists of a mixture of amylose and amylopectin. The amylopectin is quickly broken down into sugar during digestion, but the amylose is more resistant to digestion, and therefore acts as a nutritious substrate for our intestinal bacteria. It has been shown in recent decades that the intestinal bacteria are extremely important for both our

immune system and our mental health, so that dietary fiber and especially resistant starch such as amylose are important for our health. It is recommended to consume at least 30g of amylose per day, and Amylina barley is a good source to reach the recommendation.

Others have tried using genetic engineering to develop barley varieties with a high amylose content, but the Amylina barley shows that you can do the same with ordinary organic plant breeding techniques.

Barley for feed and malting

Landsorten's spring barley also comes from the German biodynamic plant breeder Cultivari. It has really good growing characteristics for organic growing conditions, where especially the weed competition is significantly better than the conventionally bred varieties. A very reliable variety, which is suitable for both malt and fodder.

Oat

Naked oat

Ordinary hulled oats have chaff around the kernels, which must be removed mechanically before you can make oatmeal from the kernel. Naked oats are characterized by the chaff falling off completely by itself during threshing. Therefore, with naked oats, you can make your own oatmeal without a de-husking equipment. Also for feed use, naked oats, like naked barley, have an advantage in that digestibility is improved by avoiding the chaff in the feed.

There is therefore every reason to increase the cultivation of naked oats, and Landsorten has seed of some good varieties that are suitable for organic cultivation.

Buurholt's fatty oat

As an alternative to naked oats, you can improve the digestibility of regular oats by de-hulling them in the same way as you de-hull oats for oatmeal. To further improve the feed value, varieties with high fat and protein content can be used. Buurholt's oil oats has a fat content that is 50-100% higher than ordinary oat varieties. Dairy cows in particular can benefit from fatty oats, but both humans and other animals also benefit from the oats' content of valuable omega-3 fatty acids.

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