Let's make grain great again

The Landrace

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Seed is sown and the plants are growing.

Meanwhile, I hope you'll enjoy reading

Anders Borgen

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Text: Anders Borgen.

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The Landsorten organisation

Landsorten had the annual general assembly at Café Bagtanker in Skørping, DK the 3th March 2022. No new big things were decided, and after election the new board was constituted as follows:

1. Morten Øster Kristensen, Samsø Mel, president (re-elected)
2. Bjarne Hansen, Aurion/ORIGENAL, secretary
3. Anders Borgen, Agrologica, accountant,
4. Lars Sørensen, ZBC og Ørbæk Økolandbrug
5. Karsten Kjærgaard, Livø Avlsgård

- Harald Hvalkof Kristensen, Baritsgård (1st alternate)
- Helle Martinsen (2nd alternate)

Figur 1: Baker Teit from Bagtanker baked a variety of breads from the Landsorten catalogue.

Landsorten's field day 22nd June 2022

Landsorten's annual grant field day will this year be held at Agrologica's field trials the 22nd June. It all starts at 10.30. Lunch and participation is free for members of Landsorten.

The field day will include a tour among the 10.000 plots and micro-plots, and there will also be a discussion about the seed system that Landsorten is building up.

If you have not received an invitation by mail for the event, please contact Lone Andreasen (lone@landsorten.dk), because in that case something is wrong regarding you membership registration. All paying members should have been properly invited by now.

Open field research day 18th July 2022

The Landsorten field day will mainly be Danish speaking with a focus on seed production, and if your interest is of a more scientific approach, Agrologica invites researchers, breeders and English speaking professionals to an open field day to discuss organic breeding techniques and in particular research on resistance to common bunt in wheat. Please contact Anders Borgen (borgen@agrologica.dk) for further details.

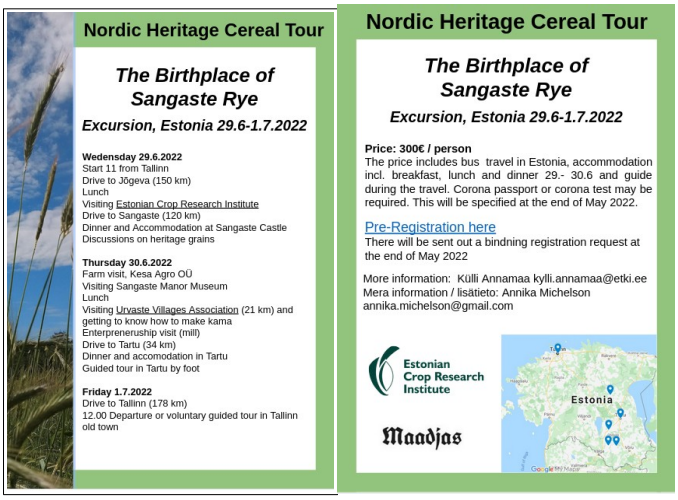
Danish Organic Field Day 15th June at Erholm estate

Landsorten will participate in the national organic field day with demonstration plots of a selection of the most popular spring sown varieties and populations. The field day runs the whole day 9.00-20.00 at Karen Borchenfeldtsvej 2, 5560 Aarup.

For further information: https://velas.dk/oeko-markdag?Tag=oekologi

Nordic cereal seminar 2022

This years traditional Nordic/Baltic cereal come-together is this year organised by Estonia and will take place 29th June to 1st July. It will be more of an excursion than a conference with visits to Sangaste and other hot spots of Nordic heritage cereals. For more info: Heritage Cereal trip to Estonia



Certified seed from Landsorten for the coming season

Grain marketed as seed on normal terms needs as a general rule to be certified in EU. Therefore, seeds from Landsorten is not marketed on normal terms. Seed from Landsorten has so far only been sold to members, and only for trial productions. This however is going to change.

Landsorten has applied the Danish authorities to approve the spring wheat population Mariagertoba and the winter wheat population Popkorn as Organic Heterogeneous Material according the new EU regulation on organic production. In this way we hope to be able to market these two populations as certified seed for the coming season beginning September 2022. Contact Bjarne Hansen (bjarne@aurion.dk) in due time if you need seed for the coming season

Landsorten is also developing the seed system for the minor varieties and population where production is too small for certification to make sense. Landsorten has now more the 100 varieties and population that are in multiplication for the members. We hope there are also some that fits your needs. We are working on a system for production planning and to define quality criteria in order to ensure that seed from Landsorten meets you expectations. We will tell more about this at the field day.

New faces in Landsorten

The BOOST-project has given Landsorten the opportunity to employ two new persons to make things going in the organisation. The BOOST-project receives financial support from GUDP, FØL og Holkegårdfonden.:

Bjarne Hansen will be the seed coordinator at Landsorten. This means that it in future is Bjarne that keeps track on who grows what, and where you can bye seed. Bjarne will be only part time in Landsorten and keeps his jobs at Aurion and ORIGENAL where hi does similar jobs.

Landsorten has hired Lone Andreasen as project manager of the BOOST-project. Lone will be in charge of the legal and organistic build up of Landsorten. Many of you will hear from Lone regarding membership fees etc. Lone comes from a position as project manager in Organic Denmark.

What has autism and A2-milk to do with wheat?

During WW2, the import of wheat into Europe decreased, and during the same period the frequency of people suffering from schizophrenia decreased. In contrast, the wheat intake of wheat increased in USA, and the frequency of schizophrenia also increased. In Polynesia, the frequency of schizophrenia was previously about 1:30.000, but increased to 1:100 when the modern wheat diet was introduced. Both cases could be caused by other reasons and cannot be taken as a scientific evidence for a cause-effect relationship, but there are reasons for arguing that the might be a connection.

If a patient is allergic to a protein, the immune system will produce anti-bodies to the protein. 87% of patients with autism has anti-bodies against wheat, whereas only 2% of the population in general has these anti-bodies. Similar numbers are observed for patients with schizophrenia. It is documented that people with schizophrenia held on a gluten free diet experience increased symptoms when exposed to gluten, and symptoms are reduced again when returning to gluten free diet.

The relation between gluten and psychiatric disorders is most likely to be caused by the gliadin in gluten. During digestion, gliadin is broken down into peptides of which some has morphin like properties (wheat exorphins). In patients with schizophrenia and autism, an increased contents of these exorphins can be found in their urin, and apparently these patients absorb more of these peptides through the intestine as do healthy people. The content of exorphins in gluten is low, and we hardly experience a high flying trip after eating a piece of bread, but it seems that a constant intake of small doses of these exorphins over long time may affect some people, in particular if a dysfunctional gut allows abnormal doses to pass into the organism.

The intake of gliadins has also another effect on the body. Gæiadin contains a peptide that by receptors in the gut is mistaken as a virus particle. When the body thinks it is infected by a virus, it reacts as we have all experienced with diarrhea. The body will release a substance, zonulin, that opens the intercellular tight junctions in the gut, and water will stream into the gut in an attempt to flush out the virus. However, when the gut opens in this way, substances from the gut including exorphins can also pass the other way into the bloodstream in increased amount. The zonulin also has another effect in the body, opening the blood-brain barrier and increasing the susceptibility to neurotransmitters. There are indications that patients suffering from schizophrenia and autism are more sensitive to zonolin and therefore not only absorbs more exorphine from the gut, but also reacts more sensitive to the exorphins than do normal people.

Tegning 1: Thise Mejeri has tested the herd of mainly dairy cows of the race Jersey and found them free from the A1-gene, Hence the milk is exclusively of the A2-type. This milk can be purchased in many Danish supermarkets today

The most well known wheat related disorder is celiac disease, which sometimes is called gluten allergy, but in fact it is not really an allergy but an autoimmune disorder, where the body develops anti-bodies to specific gliadin peptides, and these antibodies breaks down the gut tissue. However, these anti-bodies can also break down other body tissues including a substance in the brain called GABA that has an important effect in regulating neurotransmittors. Hence, gluten has a long series of effects that all leads to increase the effect of these morphin-like peptides has on our body: It opens the gut so that they pass into the blood stream, it opens the brain barrier so that

they enters the brain and it deregulate the GABA that controls the effect in the brain. Therefore, sensitive people reacts with psycological effects like schizophrenia and autissm, but in some cases also with other disorders like depression, anxiety and eating disorders.

Milk contains casein as the main protein. Casein very much resembles gliadin in wheat and has many of the same effects in our body as do gliadin, only to a minor degree.

Like gliadin, intake of casein hence triggers zonulin release, opening the tight junctions and blood-brain barrier, and it contains peptides with morphine like effects in our body (β-casomorphin-7). It should not be a surprise that casein has these effects on our body, because they are both natural and beneficial. Our consumption og milk is naturally related to infancy, and after consumes of breast milk, the baby is supposed to relax, and a bit of morphine always helps with that. On the other hand, if the baby gets no milk and gets hungry, it cries, and morphine abstinence increases the effect and calls the mother.

If the baby gut was closed all the time, anti-bodies from the breast milk could not pass the gut barrier and protect the baby from infections, and the exorphins could not have the positive effect on the infant. It is therefore most natural and beneficial that casein has the effect of triggering zonulin that opens the tight junctions. The problem arises when grown-up people constantly consume milk or wheat, and in particular special sensitive people. It may also affect other people to a lesser degree, and in particular a constant intake in combination with short time fermentation processes, as a traditional long time sourdough fermentation process will break down many of the problematic substances in wheat before doing harm to the body.

Cows are not just cows. There are many different races of cows giving many different qualities of milk. Already in the bronze age, a mutation occurred in a European cow. This mutation denominated A1 has spread to the majority of European dairy cows, including the Holstein-Frisian cow that almost all modern dairy cow breeding is based on. Modern dairy cows are in some respect extremely inbred, and 90% of all global milk production is produced by Holstein-Frisian cows that all decent from only 6 bulls. The A1-gene that is therefore now widespread in most dairy cows in the world, increases the neurological effect of peptides in the milk, and has 4 times more BCM-7 (β-casomorphin-7) than milk from the original cattle A2-milk.

The problem with wheat as a food stuff seems to be that the gliadin in wheat assembles casein in milk so much that the body thinks it consumes milk and reacts like an infant with an undeveloped immune and gut system. At the same time the neurological effect of gliadin is much stronger than casein from both A2 and A1 milk. Even though is makes sense to look critical into the widespread use of A1 milk, it is likely that it will have more effect on public health with a critical look at the neurological effect of the consumption of non fermented wheat.

Wheat in the form of emmer was the first crop developed by mankind, and wheat has since then been the most widespread crop and food stuff in the world. The global intake of wheat provides humans with 30% of our protein and energy. There are reasons to believe that the minor daily intake of morphin-like substances from wheat is part of the reason for the popularity of wheat, and indeed for the very introduction of agriculture. Wheat and milk is dominating our diet today. We may think it is because of the taste or nutritional value, but by the end of the day we are just addicted

For a more detailed insight into the effect of wheat on human health, I refer to a report I’ve written on the topic, including references for further self studies.

Pearl Rye from Borris and the quest for original Danish rye varieties

Landsorten is now multiplying Borris Perlerug (Pearl rye from Borris), and you may ask why in particular this variety, that is unknown by most?

Denmark has one of the highest consumptions of rye per capita in the world, but even so, rye is not bred in Denmark at all any more. Most farmers, including organic farmers, grow hybrid rye from the different multinational companies offering seed on the global market. You can use home saved seed from hybrids, but hybrids are not stable, and soon it will change and develop into something different. Some farmers therefore request traditional stable varieties, and some request original local varieties.

But what is local, and in this case the original Danish rye variety really?

The recent history of rye in Denmark

In the start of the 19th century, landraces of rye were grown all over the country. Rye was by far the dominating crop for bread production, and wheat was grown on less than 5% of the area, in particular on the south eastern islands and on some estates for the nobility. The general population ate rye for the daily bread and bread baked on wheat was referred to as cake and only consumed at weddings and similar rare events.

Rye landrace varieties grown on the eastern part of the country was referred to as Danish rye, whereas rye grown in the less fertile soils in Western Denmark was referred to as brown rye or heath rye. During the 19th century, new varieties was introduced in Denmark from abroad. The Provsti-rye was the main variety original from the eastern part of Holstein. The variety had larger and more light coloured seed than the Danish varieties, but was also taller and more susceptible to lodging. In the eastern part of the country, the Provsti-rye almost replaced the Danish rye completely. The German biodynamic breeder Karl-Josef Müller from Cultivari from the area near Lüneburger Heide has bred a light coloured rye variety, Lichtkornroggen that may be considered as a modern Provsti rye.

In the later part of the 19th century, several other varieties was imported into Denmark. From France the Campine rye was introduced, and was highly recommended for the high yield. From Germany the Schlandstedt rye was introduced that gave lower yield on most soils, but had a very stiff straw and therefore resisted lodging on good soils. From Saxony we got the Bestehorn's rye, even though it disappear again after being grown for some time in Denmark.

Around 1880 two varieties was introduced, that totally came to dominate Danish rye production. The Brattingborg rye and the Petkus rye.

The origin of Brattingborg rye is a bit uncertain. The name refers to the estate Brattingborg on the island of Samsø, where the owner duke Danneskjold-Samsøe introduced it from Viborg on the Jutland mainland. For many years it was also called Brittany rye because it was claimed that it was imported from France, whereas others claimed that this was not true and just was a kind of a marketing trick, and that is was indeed just a version of the original brown rye from Jutland.

Rye is cross pollinating, and will as such cross with neighbouring plants and fields, unless grown several hundred meters apart. This may have been difficult to enforce in an area and time where rye was by far the dominating crop. It may therefore be that the origin of Brattingborg was a mix of brown and French rye. We may never find out. Nevertheless, Brattingborg became the most grown rye variety on the lighter soils in particular in the western part of the country where it was known for the excellent frugality and superb bread making quality.

Like all frugal varieties, Brattingborg had a weakness when grown on better soils under good fertilisation, where the tall straw was inclined to lodging. On such soils, the Petkus rye performed better. It was introduced in 1881 after being selected by estateholder von Lochow from Brandenburg out of a local variety named Pirna. For more than century, the Petkus rye was the most grown rye in Northern Europe, which is also the most rye growing area in the world. The income from the successful breeding also laid the basis for the company Lochow-Petkus, that has been one of the leading plant breeders in Northern Europe. Like most other plant breeders, Lochow-Petkus is now engulfed in a multinational agro-concern, KWS.

In contrast to the brown colour of original Danish varieties, and the light coloured kernels of the Provsti rye, the Petkus rye has bluish kernels. This trait is still dominating in most modern rye varieties, and most of them also comes more or less directly from Petkus.

Most varieties in the genebanks of Danish origin comes more or less directly from Petkus, but a single variety Borris Perlerug (Pearl rye from Borris) is selected from Brattingborg rye. Borris breeding station in Western Jutland specialised in breeding for low input conditions in marginal conditions and found in 1948 rye the traits needed in the Brattingborg rye. However, the need for traits fit for low input conditions was not the future in post war agriculture in Europe, and Borris Perlerug therefore could not compete with Petkus, not even on the poor soils when fertilised with the new agrochemicals. Pearl Rye from Borris therefore ended up in a gene bank collection, hidden and forgotten by posterity.

When Landsorten now has decided to reintroduce Pearl Rye from Borris to organic farming, it is because it as far as we know is the only Danish rye that at least by history does not descent from Petkus and other dominating rye varieties descenting from it.

Links to previous issues of the newsletter:

- The Landrace no. 7, December 2021
- The Landrace no. 6, September 2021
- The Landrace no. 5, May 2021

Links to Danish versions:

- Sigtekornet nr. 7, december 2021
- Sigtekornet nr. 6, september 2021
- Sigtekornet nr. 5, maj 2021
- Sigtekornet nr. 4, januar 2021
- Sigtekornet nr. 3, maj 2020
- Sigtekornet nr. 2, december 2019