terra HORSCH

29 | 2024

Find A WAY

Environmentally conscious and yield-oriented

ISSUE 29

Imprint

terraHORSCH is the international customer magazine of HORSCH Maschinen GmbH
Sitzenhof 1, DE-92421 Schwandorf
Phone: +49 9431 7143-0, Fax: +49 9431 7143-9200
terra@horsch.com, www.horsch.com

Responsible for the content: Cornelia Horsch

Edited by: Johannes Hädicke

Articles: Galyna Bilchenko, Sophia Bleyer, Johannes Hädicke, Cornelia Horsch, Juliane Pauls, Pascale Scirocco, Josef Stangl 2

Photos: Archive HORSCH, Archive Wölfleder Bernhard GmbH, LoAgri, RDN, Balticagrar SIA (private), Dodola 2021 GmbH (private), DWD Deutscher Wetterdienst, Ecorobotix, LWB Giessmann (private), Olena Saveliushkina, Vesa Tammilehto (private)

Translations: English: Heike Wolf; French: Stéphane Proust, Pascale Scirocco; Barbara Dudkowski; Russian: Vyacheslav Veklenko; Ukraininan: Halyna Bilchenko; Hungarian: Axial Kft.; Portuguese: Arno Dallmeyer; Czech: Chicory s.r.o.; Slovakian: Marian Kukučka; Serbian: Agromarket Machinery DOO.; Croatian: GO 2 BARANJA J.D.O.O.

terraHORSCH is published twice a year in the following languages: German, English, French, Croatian, Polish, Portuguese, Russian, Serbian, Slovakian, Czech, Ukrainian and Hungarian

Production & Graphic Design:
Beckmann Verlag GmbH & Co KG, Lehrte

Print: Frischmann Druck und Medien GmbH, Amberg

Paper: 250g/qm and 100g/qm Maxi Offset. The paper is certified according to the EU Ecolabel. This label is only granted for products and services whose environmental consequences are considerably lower than those of comparable products. For more details see www.eu-ecolabel.de.

Printing ink: Printing ink QUICKFAST COFREE. Free from mineral oil and cobalt. Moreover, it is certified and recommended for printing according to the „Cradle-to-Cradle" principle (quasi "from the origin back to the origin) – an approach that deals with the spreading of continuous and consequent recycling management. For more details see www.c2c-ev.de.

Dear Reader

2024 was characterised by extreme weather conditions worldwide: England, parts of France and Belgium suffered from rainfall and wet conditions while in Romania and Bulgaria the sun and extreme heat destroyed crops. Other regions partly had normal to record harvests.

Climate change forces many farmers to adapt or change their cultivation methods. In dry regions, farmers focus more on direct seeding and change their cultivation systems.

In general, it can be observed that farmers, because of both climatic changes and the price increases for rent and land, are increasingly refining their cultivation methods in order to secure their yields to the extent to which they can influence them.

In this issue there are several articles on the topic of precision and also creative ideas that may give you food for thought.

I wish you a Merry Christmas and a happy, successful, healthy and, above all, peaceful New Year 2025.

Cordially

Cornelia Horsch

01 One of the first stops of the Roadshow 2024 was in Sweden.

02 A central theme inside the show truck was the Intelligence section.

Roadshow 2024: HORSCH on tour again

From September to November, the HORSCH Showtruck was once again on tour throughout Europe to present machines and innovations to customers. On the occasion of HORSCH's 40th anniversary, the motto was '40 Years of Innovation'.

In September, HORSCH once again went on tour across Europe with a Showtruck to present machines and innovations to customers and sales partners directly on site. After the 2021/2022 roadshow which was initiated after the Covid 19 pandemic, this is the second edition of the format. This year's roadshow kicked off in Skurup, Sweden.

FOCUS ON EXCHANGE

The HORSCH Roadshow 2024 was organised in close co-operation with the local sales partners. At the various stops of the tour, HORSCH presented a selection of machines and relevant technologies, customised to the specific requirements of the respective markets. At some stops, there were also field demonstrations where the machines were shown in action in the field.

As HORSCH always focusses on being close to the customer, this format offers the ideal opportunity to discuss on site and to have an intensive exchange about regional characteristics, current challenges and problems. Both current and future challenges and possible solutions were discussed. Such dialogues always provide valuable feedback and insights which both sides benefit from.

The centrepiece of each stop was the Showtruck themed '40 Years of Innovation' to mark the company's anniversary. Inside, visitors were able to delve into the history of HORSCH and learn more about the evolution of the different product groups: from the first development (Seed-Exactor) to the legendary Terra-Trac and the sectors of tillage and single grain seeding technology to the integration of the crop care sector and developments from the hybrid farming and Intelligence sector. Solutions from this product family were also presented inside the show truck. Visitors had the opportunity to test the functions of HorschConnect or to find out more about the PartFinder and the RowControl distributor tower.

TOUR ACROSS EUROPE

After starting in Sweden, the truck continued its tour through Scandinavia (Finland) before making a few stops in the Baltic states (Estonia, Latvia, Lithuania). It then travelled on via Poland and Slovakia to Austria. Then came the first stops in Germany before the truck made its first stop in France. From there, the journey headed south, to Spain to be precise. After another stop in the centre and north of France, it headed back to Germany for another stop before the Roadshow 2024 came to an end in Italy. Within two and a half months, the truck stopped at 25 locations in twelve countries.

At the roadshow in Triesdorf, the machines were shown in action in the field – like here the Sprinter SL with the Partner FT front tank.

WHERE DOES THE FERTILISER COME FROM?

The first part of the "Solid & liquid fertilisers" series dealt with the question of when maize needs nutrients. This part takes a look at the technical aspects of nutrient supply, answers the question of how and where fertiliser can be applied with the Maestros and gives an outlook on future objectives.

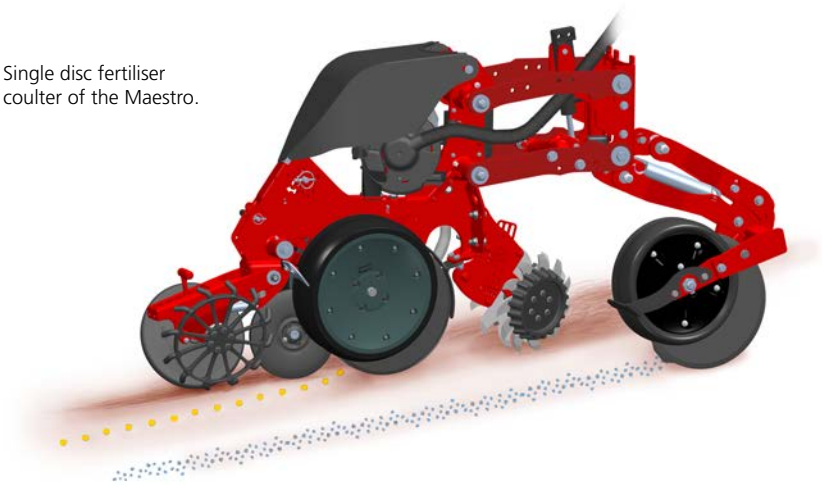
Underground fertilisation

At the end of the 20th century, the fertiliser device increasingly became standard for single grain seed drills. Today, it is impossible to imagine maize seeding without the conventional underground fertiliser coulter – almost every machine in this sector is equipped with it.

For the Maestros, two different types of coulters are used: a single disc fertiliser coulter and a double disc fertiliser coulter. The single disc coulter is the most common version. Regardless of the machine type, it always has its own suspension which is parallel-guided or rubber-cord mounted. As a result, there is no interaction between the seed row and the lower working fertiliser coulter. Stones or vibrations, for example, can cause disturbances at the fertiliser coulter, but they do not have a negative effect on the seeding result.

The horsepower requirement of the single disc fertiliser coulter is very low, and it penetrates the soil reliably even in heavy and hard soil conditions. The coulter pressure can be adjusted hydraulically or mechanically according to the conditions of the site. Due to its stable design and the carbide-coated skid, it is ideal for high operational speeds. Moreover, the lateral depth control roll reduces earth movements to the side and prevents soil from breaking apart in wet conditions. The working depth can be adjusted flexibly between 5 and 9 cm. When working without fertiliser, the fertiliser coulter can also be lifted and deactivated without tools.

As an alternative to the single disc coulter, a conventional double disc fertiliser coulter can also be mounted on the Maestros for underground fertilisation. It is attached directly to the seed body and, thus, its depth can be controlled precisely. This coulter is partly still used on very, very light soils.



Single disc fertiliser coulter of the Maestro.

Solid fertiliser

For conventional solid fertiliser application, the fertiliser is supplied either via the Partner FT front tank or an integrated central fertiliser hopper for all machines in the Maestro series. The central hoppers are mainly pressurised hoppers. The advantages are a reliable metering process and the avoidance of fertiliser dust while metering. All in all, the pressurised hopper system provides more flexibility and greater reliability when metering even with high fertiliser application rates. For some machines, double fertiliser hoppers are available as an option, for example to carry different single component fertilisers along which can then, depending on the requirements, be mixed individually via a manual control system or application maps while metering.

The time windows for seeding are tight. To work as efficiently as possible during this time, HORSCH offers different systems with regard to the hopper partition. Thus, the ratio of fertiliser and seed can be ideally adapted to the crop and the fertiliser strategy. This means that a higher quantity of seed with a lower fertiliser application can increase the range to cover more land in a shorter time as the hopper partition and the seed quantity reduce the filling stops.

01 Microgranulate unit directly at the row.

02 Central microgranular tank with a capacity of 300 litres.

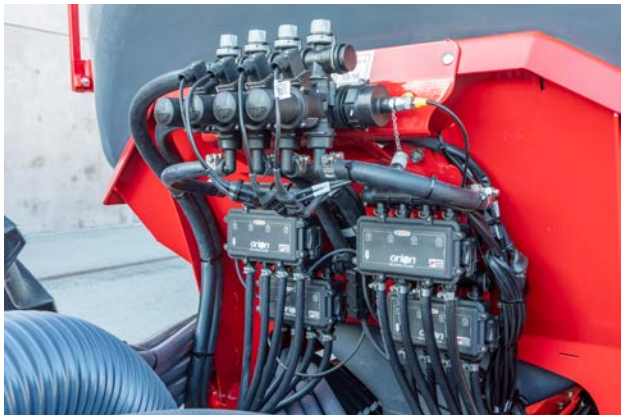
An optional agitator shaft is available for the fertiliser tank for poorer fertiliser qualities or for fertilisers that have been stored for too long. It is not driven permanently to avoid an additional constant oil consumer. The agitator shaft only works occasionally to prevent a bridging effect but at the same time to not damage or grind the fertiliser. The agitator shaft therefore ensures that the fertiliser is applied safely, regardless of the quality.

As an alternative to underground fertilisation, almost all models can be equipped with a contact fertiliser system as an option. A small amount of solid fertiliser is applied directly into the seed furrow at the grains via an adapted fertiliser system. In this case, there is no need for fertiliser coulters on the machine. This system is ideal if, for example, nutrients have already been applied on the field in advance by mineral or organic fertilisation or will be applied later (e.g. in liquid form). Contact fertilisation is ideal to optimally supply plants at an early stage and promote rapid juvenile development. If, for example, climatic conditions require early seeding in still wet, sticky soil, contact fertilisation can be a great advantage.

It prevents that too much soil is disturbed by a fertiliser coulter and that a wedge is cut out between the fertiliser and the seed furrow. Nevertheless, a targeted starter nutrient supply for the plants can take place.

As already mentioned in the first article (When does maize need nutrients?), contact fertilisation is about the starter nutrient input and the supply of nutrients to the plants from the

Maestro 24 SX L with liquid fertiliser equipment.



Liquid fertiliser monitoring system.

time of emergence until the time when the fertiliser that was applied in advance has been developed, the soil has warmed up and mineralisation has begun.

Microgranular unit

Each HORSCH Maestro can always be equipped with at least one microgranular unit for the application of fertiliser granules, plant protection agents (depending on the region), slug pellets (observe individual approval situation) and undersown crops. The standard solution is the central hopper with pneumatic distribution via a separate microgranular distribution tower and the application in or on the row. The specifically adapted metering technology ensures that the usually very abrasive granules are applied safely and without material wear. Double granule solutions are already available for some of the machines (e.g. MiniDrill and/or front tank) which allow for various combinations. Nutrients and crop care agents are applied in the row while slug pellets, for example, are spread on the row via the rear application spot by means of a baffle which is particularly effective in preventing slug damage in rapeseed, for example, and can save an additional pass.

With the introduction of the new electronic system (I-Manager) for the Maestros, it is possible to set up a microgranular system on each individual row that is independent of the rest of the machine – i.e. independent of the fertiliser hopper and the rest of the machine equipment. The background is as follows: large machines of the Maestro series are primarily equipped with a central hopper for easier filling, higher capacities and therefore a wider range. In the smaller segments where the machines are equipped with normal 70-litre seed hoppers, all models can be equipped with a microgranular unit on the row in the future to apply smaller quantities of microgranular compound mechanically. This microgranular unit on the row is located behind the seed row tank and can be switched off individually by SectionControl to save granules resp. to meter each row individually.

Liquid fertiliser

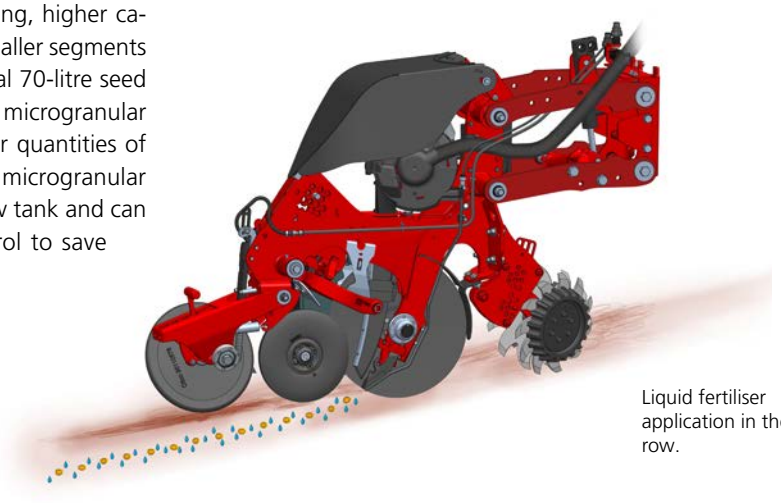
The Maestro SV L/SX L series is equipped with liquid fertiliser equipment as standard. There is a central hopper for seed and a tank for liquid fertiliser which contains a pump control as well as an individual row monitoring of the liquid fertiliser application. The sectional switching is carried out via a system that will also be fully integrated into the HORSCH electronics in the future. The sectional valve control allows for switching off the liquid fertiliser application. In the 3-point segment, liquid fertiliser equipment is available as an option, e.g. via the Leeb CT (liquid front tank).

There are three different application points to react to moisture and soil conditions. As a starter nutrient, the fertiliser can be applied directly in front of the drop/shoot tube. As an option, the liquid fertiliser can also be applied behind the catching roller in the seed furrow. This may be necessary in wet or sticky conditions to ensure a good embedding of the grain by the catching roller and to prevent unnecessary smearing of the side walls of the seed furrow.

A special liquid fertiliser single disc coulter was developed for the underground application of liquid fertiliser, based on the normal solid fertiliser single disc coulter. By reducing the angle, it has been adapted to the application of liquid fertiliser to cause less soil movement. Moreover, it contains a corresponding hose system for liquid fertiliser.

In the future, HORSCH aims to offer a liquid fertiliser option that is individually adapted to the different Maestro models for every machine: integrated, with a saddle tank or in combination with the Leeb CT front tank a pre-series version of which will be tested with various combinations in 2025. The hose system for liquid fertiliser application is already available for some machines, but functions such as flow monitoring and sectional shut-off are not yet fully integrated and are only available in combination with the I-Manager. Currently, the R & D department is working on making the liquid fertiliser option standard in addition to solid fertiliser, which already is available as standard for all machines. A big step in this direction is to create variance and combinations.

In the next terraHORSCH, we will report on the agronomic findings of our test series with regard to fertiliser application and the combination of different fertiliser methods.



Liquid fertiliser application in the row.

Insiders' tip Cultro – Why is the knife roller becoming more and more important?

Initially, the Cultro was developed to be used after rapeseed or sunflowers. In the meantime, it is used in almost all crops. Vadym Koval (sales HORSCH Ukraine) explains the advantages of the knife roller and why it is becoming more and more relevant, especially in increasingly dry periods.

The Cultro ensures optimum crushing with minimal soil movement. It was originally developed with a focus on crushing the harvest residues of rapeseed and sunflowers and accordingly was equipped with a packer. The crosswise arranged knives ensure a maximum crushing effect and, due to their extremely shallow cultivation, create a mulch layer. Already in the first year, the combination of knife roller and 3-bar harrow proved its advantages with regard to the longitudinal and cross distribution of the harvest residues.

Especially the combination with the harrow was used very quickly in cereals and is becoming increasingly important in this sector. "Many customers cultivated the soil after the combine harvester with a disc harrow, for example, to encourage the germination of volunteer crops. Due to the shallow cultivation, the disc harrow achieved good results. However, the water loss of the soil tends to be higher the more soil is cultivated. This is a major disadvantage, especially in dry regions where we have to do anything we can to keep the water in the soil," Vadym Koval who has discussed this issue with numerous farmers in the Ukraine explains.

KEEPING WATER AND NUTRIENTS IN THE SOIL

In view of the climate change and more periods of drought, the issue of saving water is becoming increasingly relevant: "We realise that we have to fight for every drop of moisture.

The Cultro TC with the 3-bar harrow excels due to the reliable longitudinal and cross distribution of the harvest residues.

Vadym Koval, sales HORSCH Ukraine.

In this respect, the Cultro plays a crucial role. It is the ideal tool for crushing and evenly distributing the straw immediately after the harvest. This creates a permanent straw cover."

There usually is a certain amount of residual humidity in the soil that needs to be retained. The straw cover heats up due to the solar radiation during the day. Below, there is a layer of 2 to 3 cm of loose soil where humidity gathers. The combination of hot day and cool night causes condensation. Due to the straw cover, water and nutrients can be retained in the soil as the humidity circulates between these two layers and does not escape.

"Seed drills like Avatar, Sprinter, Focus or Pronto can then sow directly into the stubble. Thus, we achieve regular emergence due to the preparatory work of the Cultro and by sowing into the water-bearing horizon. Most of the Cultros in the Ukraine run in the south of the country, where it is particularly dry. This method works very well here.'

VERSATILE USE

The knife roller has a wide range of applications. In addition to crushing, the distribution of harvest residues across the entire field plays a major role in cereals. This does not only involve the straw, but above all the chaff which usually is the greater challenge. During the harvest, residues are not always cut and distributed optimally, e.g. if machines are stationary, if there is a strong crosswind or if the straw is damp. "With the Cultro, we can perfectly distribute straw and chaff across the entire width. Operational speeds of up to 25 km/h create a certain vacuum effect. First, the straw is lifted before it can be distributed lengthways. During cultivation, we drive at an angle of 15 degrees to the stubble resp. to the direction of the combine to achieve an ideal result," Vadym Koval explains.

The harrow also encourages the germination of volunteer crops and weeds and breaks the capillaries to stop evaporation. "If farmers carry out less tillage measures, they have to have the distribution of chaff and straw as well as volunteer crops under control," Vadym Koval says. This also involves field hygiene and the issue of mice. The distribution of straw deprives them of shelter/habitat while the germination of volunteer crops minimises the winter supply.

The Cultro is also used in the catch crop sector: "Some customers use it for cultivating and incorporating catch crops.'

EFFICIENCY AND LONG SERVICE LIFE

"In the Ukraine, farmers are now using the Cultro on every field and in every crop. We recently used it after peas. After peas, the soil is very fine, so we don't need a cultivation pass with a disc harrow. With the Cultro, we can work more efficiently as higher speeds are possible and, due to the low horsepower requirement, we also save on diesel."

The versatile use results in enormous work rates: "One machine can easily work on around 6,000 to 10,000 hectares per year. The working widths of 9, 12 and 18 metres that are used in this market, combined with the high operational speeds, allow for an enormous work rate. With the Cultro 12 TC, we can cover up to 250 hectares in one working day (12 hours). Despite the working width, the horsepower requirement of the machine remains extremely low which is reflected in the low diesel consumption." The demand for a 9-metre Cultro increases due to its advantages.

Another advantage is the low maintenance requirement. The machine has only a few lubrication points and the harrow tines are coated with carbide which extends their service life and ensures a reliable use even in difficult conditions, e.g. in very dry conditions which are always stressful for the material.

Durability, efficiency and versatile application options make the Cultro an indispensable tool. Particularly in times of climate change and increasing drought, it can make a decisive contribution to retaining water and nutrients in the soil, thus creating optimum conditions for subsequent seeding.

The Cultro 12 TC was used in the Ukraine. In the video, Vadym Koval explains the advantages of the machine.

ALL ABOUT PEAS: MAN AND MACHINE WORKING NON-STOP

You reap what you sow. Rarely has a saying been more appropriate. On a pea farm in Finland, only these pod crops are grown. To be able to always supply customers with hand-picked, fresh peas, they are sown almost every other day. A cultivation method that requires a great deal of intuition.

Vesa Tammilehto's farm is located in Jokela in the middle of an agricultural region in southern Finland. In 1985, his parents started growing peas, initially on just a few hectares, the focus was on cereal cultivation. The area under peas increased every year. The turning point was about 15 years ago. At that time, between 300 and 400 hectares of cereals and 150 hectares of peas were cultivated. However, over a period cereal prices decreased – and at the same time, they noticed that the market situation for peas was very good and that there was quite some potential. "We gave up growing cereals completely and focussed on peas," Vesa Tammilehto remembers. In the meantime, he has taken over the farm from his parents who still actively support him as does his wife. Peas are currently grown on approx. 400 hectares.

To protect the peas from the weather conditions, especially the early varieties are covered with fleece.

01 During the season, the HORSCH Avatar SL is working almost every other day on Vesa Tammilehto's farm.

02 Peas have a long cultivation tradition in Finland. In the summer months, fresh peas are often eaten raw as a snack.

Up to 150 seasonal workers

Harvest mainly takes place between mid-June and the beginning of September. As soon as the peas are ripe, they are harvested manually and delivered to the customers. They only harvest the quantity that is required. Up to 150 workers are employed on the farm during the season to manage this effort. The focus mainly is on two pea varieties that are popular with the customers, but Vesa Tammilehto is always trying out new things: "This year, we grew seven different varieties. Our objective is to extend the season and at the same time improve quality. The varieties we harvest in the off-season usually are a little bit smaller. But customers prefer the larger ones, so we also try to find suitable varieties for the off-season."

The yield varies considerably. Normally, they can harvest up to 3.5 tonnes per hectare, but it is impossible to give an exact figure: "We only harvest what we can sell. If the quality doesn't meet our requirements, we don't harvest the peas. If too many fields are ripe at the same time and we don't have enough staff or orders from customers, the peas won't be harvested either."

The local conditions for marketing are ideal: "We live 15 kilometres away from Helsinki. Our region has the highest population density in the country. So the delivery distances are short. This means we can offer a good and fast service. If customers need more peas, we can react spontaneously and supply them with fresh products."

The peas are sold to customers and markets throughout the province, including Tampere which is around 150 kilometres away. There is a dealer who sells the peas throughout the country. The sales season only lasts about three months. During this time, reliable logistics are crucial. "We hire vehicles for this period. It's important that they work properly so that we can deliver the fresh peas on schedule," Vesa explains. On average, about 200 to 300 kg of peas are sold to the customers per outlet per day – in the larger outlets even up to a tonne. The prices for the final consumer vary enormously. On average, they amount to 7 to 8 € per kilo.

The role of peas in Finland

Peas have a long cultivation tradition in Finland and figure among the oldest cultivated crops of the country. The long, light nights in summer give the peas a special sweetness. This is the reason why fresh peas are often eaten raw as a snack. They are a healthy summer delicacy as they are rich in proteins, vitamins and minerals. Unlike in many other countries, the fresh pods can be bought in supermarkets throughout the season. Vesa Tammilehto estimates that 98% of the peas he sells are eaten directly as a snack and are not processed further. But they can also be used in the kitchen in many different ways. Pea soup is particularly popular and a traditional dish in Finland.

Avatar non-stop

At the start of the seeding season, it usually is rather wet. "We try to sow as much as we can and get all the varieties into the ground – on about 100 to 150 hectares. We also cover some varieties with fleece to protect them." When the first variety are ripe, many helpers are required. The pods are comparatively smaller and therefore more difficult to harvest. "It's important for us to be efficient. So I can't employ 20 more people in the first few weeks. We have to take good decisions to make the most of the harvest," Vesa Tammilehto says. To be able to deliver a constant supply of fresh peas, around ten hectares are sown every other day during the main season. It is crucial to select the optimum quantity that can be both harvested and sold.

To meet the diverse requirements of his farm, Vesa Tammilehto needs a reliable seed drill that works optimally in different conditions. Since this season, he has been relying on the HORSCH Avatar SL in combination with the front tank Partner FT to sow the peas. "I saw the machine at the Agritechnica last year and was immediately convinced." Soon after that, the machine was delivered to his farm. "The seed drill includes all the qualities I wanted. The coulter convinced me. It is equipped with a catching roller that fixes the seed in the seed furrow, especially in dry conditions. At the same time, it the coulter pressure applied is very high."

01 Vesa Tammilehto normally rents his fields for three years. After that he needs new land. To find this new land often is a real challenge.

02 About 150 seasonal workers handpick the peas.

The different weather and soil conditions during the seeding season make particular demands on the technology. "During the season, we see everything – from heavy and wet conditions to dry periods. A reliable seed drill that achieves good results in all conditions is essential for me. The Avatar meets exactly these requirements. I also like the compact design and the fact that I can convert it quickly. I didn't want a trailed machine as it would be too long together with the tractor and as I don't need that much hopper capacity." Moreover, the double hopper at the front allows for applying fertiliser and seed at the same time – an important aspect with regard to efficiency.

The weather plays a decisive role when sowing. "If the start of the season is wet, we have to be careful not to compact the soil too much as this would impair the growth of the peas," Vesa explains. In the past, there often was heavy rainfall after the first seeding, but in the last three years, dry conditions prevailed. "We have to react flexibly to the different weather conditions. It sometimes feels like a game of chance to find the right balance. For cereals, you always make sure to sow them when conditions are optimum. That's not the case for us – we have to sow if it's only somewhat suitable. But we have good tools that allow us to handle all the challenges that Mother Earth makes us face."

The first fields are harvested at the end of June. Then a catch crop is sown, for example mustard, to cover the soil until the next peas are sown. It is incorporated with a shallow disc cultivator before the seedbed is prepared with a power harrow for the next pea seeding season in spring.

Only peas

Vesa Tammilehto only grows peas on his farm but does not own any land. "We usually rent the land for three years. After that, we need other fields," he explains. "When the business grew and the need for arable land increased, it was not easy to find suitable fields as many grain growers in the region also always look for land – a fact that drives up the prices on the market. We always rent for three years during which we only grow peas. It would be better to change the cultivated area, but then we would need 400 hectares of new land every year. That's impossible. We currently rent 100 to 150 ha of new land per year. In recent years, we have been lucky that these fields were located within a ten-kilometer radius of our farm, but some are 70 to 90 kilometers away. This requires efficient logistics," the farmer explains. Therefore, one important issue for him at the moment is to coordinate the tractors and machines in the best possible way.

"Every year, it is a big challenge to find enough land. Ten years ago, we had to take everything we could get. In the last five years, things got a little bit better. We were able to rent 50 or even 70 hectares from a farmer." The condition of the fields is always a surprise: "You never know how the fields were cultivated previously. In this respect, we have seen quite a lot."

Future prospects

Despite the many challenges, a clear objective has already become apparent when looking into the future. "I've thought a lot about what we can do," Vesa Tammilehto says. "Let's assume I would harvest 50 kilos more per hectare. That would make a big difference over the whole season. So we have to find ways to improve yield which is difficult because every season is different. A very difficult season is behind us where the weather often was really challenging. If we manage to increase our yield, we will have to rent less land and can, thus, save money which we can then invest elsewhere. At the same time, however, we cannot afford to change fundamental things from one day to the next as we always have to supply our customers with the quantities they ordered. Cost increases and the loss of subsidies also are an enormous pressure. So a sound management of the farm and the land is essential." This statement shows once again how much intuition Vesa Tammilehto's decisions require to find a good balance between security and change in order to optimise things.

The revival of a classic

With the Airseeder, HORSCH launched the first tine seed drill on the market in the 1990s. Recently, the company has once again focused more intensively on tine seeding technology and combined the findings of the Airseeder with past experience in the Sprinter series. Philipp Horsch explains the background of this 'Sprinter revival'.

In the 1990s, shallow tillage played a major role for us," Philipp Horsch explains. "Due to our early contacts in the USA and Canada, we were able to experience the dynamics of tine seed drills over there first-hand. In the first half of the 1990s, we started to focus on 'sowing with tines' and brought the process and the coulter technology to Europe. And we were very successful."

By the early 2000s, tine seeding technology had developed into the central seeding method in the portfolio and replaced the Seed-Exactor. "In the 90s, farms became larger and larger. The Seed-Exactor no longer met the requirements. The transition to the Airseeder, the first tine seed drill, was seamless." Both methods require thorough preparatory work and precise tillage and are ideal in stony, adverse conditions.

The Airseeders were the first points of contact with Eastern Europe, Ukraine and Russia before large tine seeders from HORSCH also found their way into the North American market. "We specifically developed Airseeders with a large working width for direct seeding in the USA and Canada. In Europe, the Airseeder was ideal for regions with heavy and stony soils or regions with high amounts of straw. The first main markets in Europe were England, France, the Czech Republic and Hungary."

In addition to a precise seeding in difficult conditions, the Airseeder above all impressed due to its ability to clear the seed horizon and cleanly remove harvest residues from the seed furrow. "Due to the Airseeder, we also started to integrate fertilisation into the seeding process. At that time, this was new for our markets in Europe. In this respect, we were pioneers. It is the best method for applying relatively high quantities of fertiliser as a depot while sowing – precisely and as closely to the grain as possible," Philipp Horsch says. With the Duett coulter, precise fertilisation below the plant was no problem. The neatly separated horizons prevented corrosion and burns.

DIVERSIFICATION OF THE SEEDING METHODS

In the early 2000s, the focus increasingly shifted to disc seeding technology: "With Terrano and Tiger, we launched new tillage methods to work deeper," Philipp Horsch explains. "At the same time, we were able to expand our sales territory across Europe. These two developments meant that the Pronto quickly overtook the Airseeder in terms of importance.

According to Philipp Horsch, the further development of the Sprinter with optimised equipment and innovations has once again strengthened the line.

Our focus clearly was on disc seeding technology. However, the Airseeder which we then renamed as Sprinter continued to be an important machine for certain regions because it offers a number of advantages," Philipp Horsch describes the developments at the beginning of the 2000s.

As farm sizes increased, it was not only the need for more seeding capacity that grew, but also the requirement to cope with different seeding conditions precisely and on time. "A

lot of farms expanded their seeding capacity in the past ten years due to the growth and in the meantime have more than one seed drill. It therefore makes sense to rely on different methods in order to use the right technology at the right time as each method has its advantages and limitations. This is a major incentive for diversification," Philipp Horsch explains. 'Many farmers then opt for a combination of tine and disc seeding technology."

In the past years, this development contributed to a massive expansion of the portfolio: "We intensively diversified our disc coulter technology, but also expanded our portfolio in the tine seeding sector. There always have been rigid tine machines like the Airseeder CO. Over the years, we added machines with individual tines and depth control roller like the Sprinter NT which was mainly developed for the large export markets and mere direct seeding regions with little residue – i.e. mainly Kazakhstan, Australia and Canada. Rigid tine machines with packer and harrow are more common in Europe. For us as a global company, it is important to cover all seeding methods that play a role worldwide. Our objective is to remain a leader in the seeding sector and to be a full-line supplier. This is our ambition on an international scale which is why we are pushing this development."

UPDATE FOR THE SPRINTER

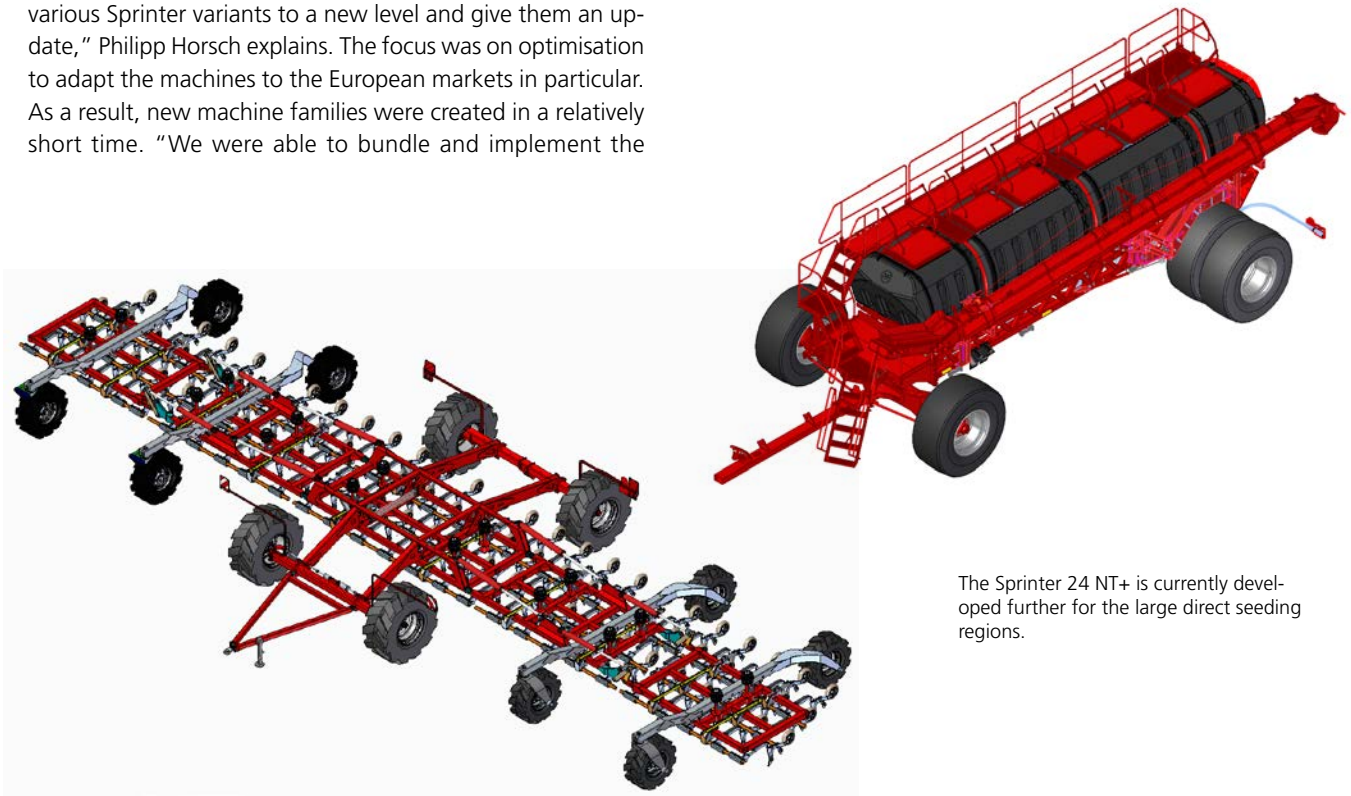
While, in the meantime, disc seeding technology was on the rise in Europe, Sprinters have always played an important role in other regions. In 2010, a comprehensive Sprinter program was developed in parallel for the export markets, with a focus on the East and Australia. "This development took place at the same time. Now it is about analysing where this technology might also fit with perhaps a few adaptations."

In 2019/2020, the company began to focus more intensively on the Sprinter series again. "We wanted to raise the various Sprinter variants to a new level and give them an update," Philipp Horsch explains. The focus was on optimisation to adapt the machines to the European markets in particular. As a result, new machine families were created in a relatively short time. "We were able to bundle and implement the knowledge gained over the last 20 years. The most important segment in the Sprinter sector in Europe has always been four and six metre machines. This was where we focussed on for our further developments. Due to the requirements, the Sprinters became heavier and larger in the past, especially in the six metre range. We then started to build more compact machines again. This resulted in the Sprinter CO. We managed to make it lighter, based on the roots of the first Airseeders for which the horsepower requirement also was very low." Due to the more compact design, the machines can also be pulled by smaller tractors, making the whole combination lighter and resulting in fewer tracks and less compaction in the field especially in wet conditions.

The coulter technology has also been optimised: "With the Sprinter CO, we have gone back to a 3-row design with a tine spacing of 25 cm. We combined this with a lighter design, new tines, new coulter shapes, new tool combinations and the integration of transport wheels so that the homologation for road service can be obtained without any problems. That was an important step. The machines were very well received by our customers because they can sow even more precisely than in the past. We were able to excellently implement the knowledge we gained over the years."

The same is true for the Sprinter NT, the version with moveable tines. It was modified into a European version with larger working widths. "Thus, we were able to significantly expand the options we need in the market," Philipp Horsch says.

The major advantages already became evident during this year's seeding season: "This year was extremely interesting because seeding was very wet and delayed in many regions. Conventional methods in particular reached their limits in many places. Especially in England, we were able to gather excellent experience with the new generation of Sprinters –



The Sprinter 24 NT+ is currently developed further for the large direct seeding regions.

The Sprinter SC has been specifically adapted to the European markets.

The Sprinter CO was developed based on the Airseeder CO and excels due to its compact design and the low horsepower requirement.

both CO and SC. The narrow coulters and the associated 'low disturbance' seeding worked excellently in the wet conditions and placed the seed very well. Due to direct customer requirements, we also tested harrow arrangements at the rear of the Sprinters in England this year which very positively supported the closing of the furrows in the extremely adverse conditions: this direct requirement/idea from a customer and then the quick implementation to still get into the field worked out great – a very good example of the customer focus of our development team," Philipp Horsch states. Despite their size, the machines are still lightweight. "The new developments significantly contribute to farmers being able to sow efficiently in these conditions.'

To continue the idea of low horsepower requirement, the tine seed drills were expanded with a completely new 3-point portfolio to work well with lightweight tractors in spring, for example.

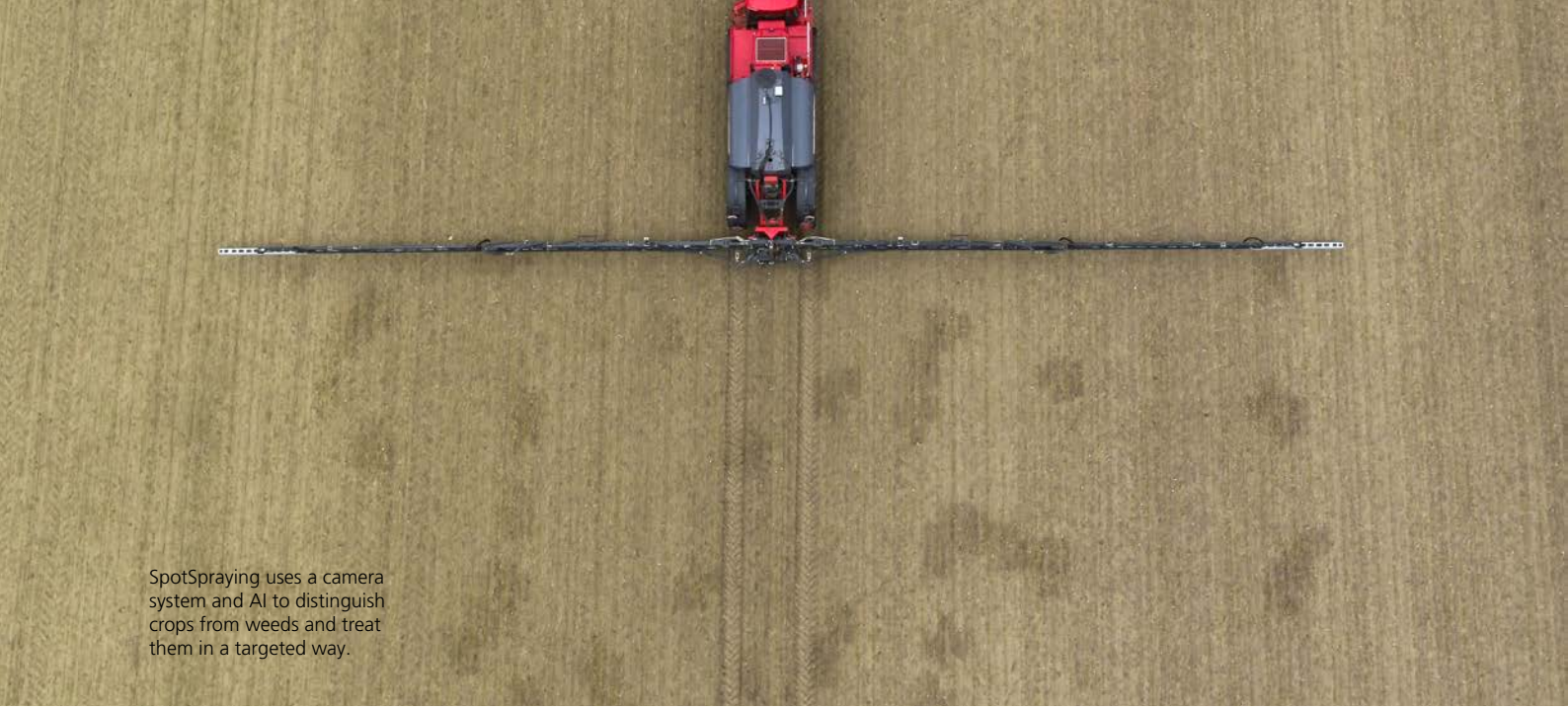
Straightforwardness also plays a major role. "The large Sprinter NT for direct seeding cannot be beaten in this respect. From a technical point of view, the design of the Sprinter NT is as simple as possible. It also stands out with regard to reliability and wear costs, making it unbeatable in large direct seeding regions."

Tine seeding technology also has its limits: "Machines with rigid tines above all need one thing: even surfaces where the seed depth is maintained by means of support wheels and packers. Machines with individually depth-controlled tines that sow without a harrow in the open furrow always reach their limits when there are very high amounts of straw or when driving too fast. The result is the so-called "stepping effect" which means that individual rows bury each other."

A LOOK AT THE REVIVAL

In the future, the focus will be on further developing the coulter to optimise it even more. "We will continue to focus on the most important element of the tine seed drill and are working intensively on expanding the coulter technology. Topics that play a role in this respect are the placement of fertiliser – both solid and liquid, multi-component capability and wear protection. But also 'low disturbance', i.e. moving as little soil as possible," Philipp Horsch looks ahead.

"Today, we are very happy with the Sprinters which we have upgraded significantly. Due to this revival with new products and innovations, we want to strengthen the Sprinter again and we notice that the market is responding very well. The importance of the Sprinter was high and is becoming higher again because we realise that we need to diversify the seeding methods. We are continuously expanding the entire product portfolio – always customised to the regions and requirements of the farmers."



SpotSpraying uses a camera system and AI to distinguish crops from weeds and treat them in a targeted way.

ALTERNATIVE TECHNOLOGIES IN THE CROP CARE SECTOR

With increasing regulations and the development of resistance, alternative technologies are becoming more and more important in the crop care sector. HORSCH works intensively on various alternatives and carries out its own tests. Theo Leeb gives an overview of the methods and the tests that are carried out.

Theo Leeb

Herbicide – SpotSpraying

In the sector of using herbicides for weed and grass weed control, we are currently observing several alternatives in the market. Spot application of weeds looks the most promising. By means of a camera system and AI, crops are distinguished from weeds and treated in a targeted way. The developments and objectives were discussed in terraHORSCH 26/2023. "We are constantly monitoring the market and are working on our own system with which we have already gathered some experience in the field," Theo Leeb reports.

They showed that the biggest challenge in SpotSpraying are the different and changing environmental conditions. Soil colour, growth stages of the crop, but also of the weeds and other factors have to be taken into account. One of the biggest influences on a good detection rate of the system is the light: "In this respect, we have to take a variety of conditions into account: from overcast skies to intense solar radiation, sun from above, from behind or from the side to the setting sun and the lighting conditions at night," Theo Leeb enumerates. Lighting that is well adapted to all conditions is currently a

Catch crop killing for direct seeding in tests in Brazil with electricity in combination with a salt solution that was applied in advance to increase conductivity on the plant.

challenge when it comes to detecting plants. "Ecorobotix offers an application device that solves this problem of different light situations by shading. The machine has a working range of 6 metres and a tunnel on top of it which completely shields the plants below from interfering light from the outside. In this tunnel, there are spotlights that always create the same conditions with regard to light and brightness inside, regardless of the sunlight or the weather conditions. This allows for a stable detection. However, because of its design, the working width of this system is limited. It is almost impossible to build a machine of this type with a width of 36 metres," Theo Leeb explains how the machine works. The system is mainly used for intensive crops like vegetables. In practice, farms mostly use this method to control remaining weeds.

Source: Ecorobotix

Ecorobotix offers an application device that achieves a stable detection by means of a hermetically shielded area.

Herbicide – Electricity

There is another approach for fighting weeds: electricity. "This method is not entirely new. There have been companies in the market that have been working on this topic for some time, but they do not yet offer a series solution. On the one hand, it is very energy-intensive what limits us with regard to working width, and on the other hand, it is not entirely uncritical in terms of user protection as very high voltages are used."

To kill a plant safely with electricity, the "exposure time" plays an important role in addition to the energy used as plants have a low electrical conductivity. To achieve the longest possible exposure time to the electricity, it has to be applied very slowly which results in low work rates. "Crop.zone has recognised this challenge," Theo Leeb says. "By applying an electrically conductive liquid to the plant, its conductivity is increased, and resistance is reduced. This allows more energy to flow through the plant in a very short time which allows for higher operational speeds.'

The design of the system is as follows: Normally, a spraying boom is mounted on the front hydraulics which is used to apply a salt solution that increases the plant's conductivity. Applicators are installed in the rear through which the electricity flows onto the plants. As it passes over the plants, an electricity flow is generated along and inside them which kills them. "This method could be used as an alternative to a total herbicide. For us, it is particularly interesting for killing catch crops when sowing with the direct seeding method. In Brazil in particular, we observe glyphosate resistance in catch crops which is difficult to fight. This is why we have also carried out tests over there. At the time of the test, the efficiency was not yet satisfactory from our point of view, especially with grass. Crop.zone works with innovative ideas and optimisations to increase the efficiency of catch crop killing." In Germany, too, we continue to keep track of this system: "It works reliably and is already used in practice in the sector of potato weed killing."

One aspect that has to be taken into account is the energy that is required: "Currently, you need at least 10 kW of power per metre working width. With a working width of 36 metres, this would amount to 360 kW or just under 500 hp plus the power to pull the implement. In comparison, for chemical crop care, we need around one litre of diesel per hectare. At the moment, the ratio is still very unfavourable.'

Professional propagation of effective bacterial strains in a nutrient solution resp. isolates in a clean room to be used as a fungicide or insecticide in a large Brazilian farm.

All in all, the system works. "For intensive crops such as vegetables or perhaps even sugar beet, it can be a good alternative," Theo Leeb explains. 'For our main crops, it is not yet efficient enough because of the energy requirement and the limited working width." However, the focus of this system is not on work rate but on having an alternative if important plant protection products can no longer be used because of regulations or resistance.

Fungicide – Biologicals

Biologicals have been a topic in the fungicide sector for quite some time: "The use of biologicals is widely spread in Brazil, and they are applied on a large scale with good results. The method is mainly used for soya, cotton and less frequently in maize. This is why we wondered whether it would also work for cereal cultivation in European conditions. Based on this, we started tests on our farms. At the moment, one challenge is choosing the right one from the large number of biologicals. During the initial tests with various products, we saw rather good results. With regard to the treatment of leaf diseases in wheat, the biologicals we selected have not yet achieved the high level of the chemicals. However, the results showed their potential, especially when the biologicals were incorporated into the spraying sequences."

In the test, the following two spraying sequences were carried out in EC 30/31 and in 39/49. The variants were 2x biologicals, chemicals, followed by biologicals, biologicals + chemicals in EC 39/49 and 2x chemicals. "We achieved good results in our tests with the combination of chemicals followed by biologicals," Theo Leeb comments.

In Europe, we still have no experience with biologicals in the insecticide sector. Transferring them from abroad is not easy with insects and the consequences of an invasion often lead to massive losses.

Outlook

"There will be an incredible number of technologies in the future, but they will only be suitable for a specific sector and not be generally applicable," Theo Leeb says. "In many tests, we noticed that although the issue of reducing the agents is very important, the additional yield achieved by a very targeted and limited use plays a particularly interesting role in herbicide application at a sensitive crop stage."

Why farmers are betting on the future

Changes in row spacing and parallel trends with regard to the machinery equipment – things that are not just happening in the USA. Michael Horsch explains how and why row spacing is changing in soya cultivation and what this means for the farmers.

In July, Michael Horsch had the opportunity to talk to Harry Stine, a renowned soya expert and breeder, in Iowa. "He is an absolute expert on soya plants," he says. "Stine has been involved in soya breeding all his life and has developed varieties that are indispensable today."

One of the first questions Michael Horsch asked the "guru of soya breeding" was whether the singulation of soya was of any benefit. The answer was unequivocal: "He clearly said no. It may look good, but it doesn't achieve any recognisable yield advantage." Stine said that row spacing is more relevant depending on the site and the plant variety.

CHANGING THE ROW SPACING

In the USA, a row spacing of 50 cm (20 inches) has established itself for soya in recent years. This allows for sowing maize and soya with the same single grain seed drill. "Some also

In July, Michael Horsch met Harry Stine (left), a renowned soya breeder, in Iowa.

01 Michael Horsch considers the global rise in rents to be a "bet on the future" that farmers have to make to an increasing extent and that they indeed make.

02 Developments in soya seeding are more and more moving away from single grain seeding towards row spacings of 25 cm (10 inches). As a result, the HORSCH Avatar concept becomes increasingly important in some regions of the USA.

sow soya with 37.5 cm (15 inches)," Michael Horsch says. In this case, for maize, every second body is lifted to sow it with 75 cm (30 inches). The big trend in the Corn Belt, however, was 50 cm.

'We are currently observing interesting developments particularly on larger farms. A row spacing of 50 cm is not optimal for maize from a technical point of view, and from an arable point of view, there is only a little increase in yield from 75 to 50 cm. This is why many farmers say: "We are going back to 75 cm and 24 rows in order to harvest two 12 rows resp. to 48 rows and 75 cm in order to harvest three 16 rows. This makes the system of header and seed drill simpler and when sowing and combining, the focus is once again more on performance and efficiency. With regard to yield, there would only be minor disadvantages, if any." However, with this row spacing it would no longer be possible to use the machine for sowing soya as both crops were previously sown with the same machine with the smaller row spacing.

Following up on this development, the following becomes evident: "Ten to 15 years ago, maize was sown first in April and then soya beans, sometimes depending on the variety, were sown at a warmer time in May." Thus, it was possible to sow both crops with one seed drill. "The new varieties sometimes even allow for sowing both crops at the same time or even soya before maize. This requires that we change our way of thinking."

For many farms, the optimum seeding window that becomes smaller and smaller means that they need a second seed drill to be able to work in parallel. "For many farms, this seems to be resulting in a new strategy: on the one hand, to work with wider (75 cm), even more efficient precision seed drills in maize and, on the other hand, to bring a second seed drill into the farm just for soya beans," Michael Horsch explains.

"Harry Stine also confirmed that in the sector of variety development they initially had focussed on a 50-cm-row. However, they realised that with the varieties that are currently on the market or coming onto the market a small increase in yield was still possible if you sow more narrowly. 25 cm (10 inches) seem to be the new optimum for soya. Provided that the placement is perfect."

This is why some larger farms tend to sow maize with 75 cm (30 inches) and no longer rely on a precision seed drill as a second machine for soya. "Single grain for soya is a nice-to-have, but not a requirement," Michael Horsch says. "This is where our 1-row Avatar which we originally developed for the direct seeding of cereals comes in." Currently, the demand for this machine is high on high-yielding sites in the USA. The Avatar is easy to use, the horsepower requirement is low, and the placement is extremely precise. "The development towards smaller row spacings makes the Avatar perfect for soya." The large seed hopper provides additional efficiency for a timely sowing, especially with soya beans.

PARALLEL TRENDS IN MAIZE

"There's no substitute for perfect weather. We see this again this year with the maize yields in the USA," Michael Horsch summarises. Rob Rudolphi from the HORSCH Product Management in the USA adds: 'We harvested 5–10% more than average this year in the central Corn Belt. 2024 proved interesting as there was little variation between practices and land quality. For example, farms with various sensors, gadgets, and intensive fertiliser strategies experienced the same yield outcomes as those with a very simple, basic approach. However, hybrid selection and disease management proved paramount. In the end, optimal weather during the growing season provided everyone with a largely favourable result."

In the single grain market, two fundamentally different approaches have become apparent. Small and medium-sized farms which can always use the optimum time window for seeding due to their acreage, rely on increasingly complex, technically sophisticated machines. With additional equipment on the row and a wide variety of nutrient placement technology, they try to further maximise the yield potential.

The challenge for larger farms almost always is to find the time window for perfect seeding for as many fields as possible. This requires machines with a high work rate. "In practice, we need even larger, more powerful machines to be able to sow as many hectares as possible in an optimum way," Michael Horsch emphasises. "Larger working widths, simpler technology and machines that are not too heavy so that they do not compact the soil too much when sowing in wet resp. damp conditions, but always with a high focus on placement quality – this is what the second pillar of the market looks like today."

The parallel trends are reflected in many places: "Whether in the USA, Brazil or Ukraine – we notice this everywhere and we have to do it justice. Where it makes sense, we have to build machines with even larger working widths, simplify technology and concentrate on the essentials. This is an important factor if we are in the optimum time window. Around this time window, we can achieve even more with complex, highly equipped machines. We have to increase the potential of these machines. And we have to deal with these two parallel trends in equal measure," Michael Horsch says.

A BET ON THE FUTURE

"We also notice these developments here in Europe, especially at times when rents continue to rise worldwide." This makes farmers invest increasingly in the future as Michael Horsch explains: "A high rent is nothing else than a bet on the future and more and more farmers are betting on the future. But why are they prepared to pay high prices even if cereal prices are not particularly high? In my opinion, the bet is justified because we will see cereal price explode more and more often which will make this bet pay off."

Those who pay high rents ultimately have to cultivate more land and grow faster so that it pays off at the end of the day. Therefore, farmers have to attach major importance to the essentials: sowing a lot of land perfectly in a short time to make the best possible use of ideal conditions for sowing in order to achieve high yields and not getting bogged down in logistics, for example."

SIGNIFICANCE FOR SOYA

The yield performance of the individual plant is often already extremely exhausted. In principle, a yield increase is possible if the population density is increased. However, there is no room for these additional plants in the 50-cm-row (20-inch) as otherwise the competition in the row would increase too much. "If we look at this contradiction, the result is to use the 25-cm row. With half the row spacing, additional plants per m² can be well distributed. The prerequisite is perfect placement and embedding for safe and even emergence," Michael Horsch points out.

Soya is very thermophilic. The only rain that counts is during the blooming period from mid-July to the beginning of August. "If it rains at this time, the prospects for high yields are good." Moreover, soya can cope very well with extreme amounts of rain. This is why it is so popular in South America. We currently observe this in Brazil with 2,000 mm of rainfall. Soya can compensate for many extreme events, including heat, as long as the rain comes during the blooming period. If this is not the case, the compensation is also poor.

"In Central and South-East Europe, the yield risk for summer crops has increased dramatically in recent years. Especially in dry years, winter crops which were able to generate yields from autumn and winter precipitation were much more reliable. Soya is not the best choice for sites with severe early summer and summer drought and low water holding capacity. Though it copes comparatively better with heat than maize, it requires a lot of water at the right time," Michael Horsch explains.

Agriculture in wartime conditions

Despite all of the losses and challenges, farmers in the Ukraine are continuing their work and are even investing further. They are working at the limit and are challenged anew every day. Endless fighting, extreme weather conditions, unpredictable prices, a lack of logistics and difficult sales channels characterise everyday life.

Vasil Shtendera, the owner of the Dodola 2021 Ltd. farm in the Kherson region in southern Ukraine, is a fan of no-till farming. He has been working very successfully with this method for more than 15 years. Precise farming and state-of-the-art technology are a matter of course for him. Before the war, he harvested two crops a year from one field – soya was sown on irrigated fields after the winter crop.

DO WHAT IS POSSIBLE

The Russian invasion suddenly turned all of the farm's fields – around 4,200 ha in total where previously wheat, rapeseed, sunflowers and soya were grown – into a theatre of war which was criss-crossed by lines of defence. "Our normal life collapsed from one moment to the next. Nevertheless, we did what we could. Firstly, we helped the local people: We produced flour and oil and distributed the goods. We also

Vasil Shtendera in a rapeseed field. Due to the high price and the low need for logistics capacity, rapeseed currently achieves the highest yield.

The self-propelled sprayer HORSCH Leeb VL was purchased this year.

The Dodola 2021 GmbH plant is still situated in a 20 km zone from the front line.

supported hospitals with fuel deliveries to ensure the power supply. And, of course, we evacuated our employees and their families," Vasil Shtendera recalls.

They also had to take care of the technology immediately. As checkpoints jeopardised the transport, many machines were hidden in private gardens and in the yards of employees who had remained on site. Smaller machines were even literally buried in the ground. Thus, they managed to save at least some of the important technology.

Looting was a daily occurrence on the farm and in the warehouses: lorries, the crane system, irrigation equipment as well as a Merlo loader with a lifting height of 9 m and a JCB machine disappeared. Around 300 tonnes of fertiliser (liquid AHL), crop care agents and seeds were stolen. The storage drums for 150 to 200 tonnes of liquid fertiliser were damaged and destroyed. The irrigation system was frayed beyond repair. Moreover, fields were burnt by enemy rocket attacks. For example, at the beginning of March 2022, 180 ha of winter wheat (expected harvest: 4 t/ha), 200 ha of winter rapeseed and a further 150 ha of rapeseed were destroyed within one harvest season. The total damage amounts to over UAH 40 million (approx. EUR 1 million) – not including the irrigation system.

NEW START IN THE MIDDLE OF THE WAR

In November 2022, up to 70 % of the fields were reclaimed successfully. However, the regeneration took until June 2024. About 80 % of the employees have since returned. Dodola 2021 Ltd. currently employs 30 people.

The technology was repaired single-handedly by the farm staff. In addition, the fields had to be demined. As there were no government programmes yet and state aid was limited to emergencies, the farm hired a mine clearing service at its own expense. "There was hardly any official help to be expected. And because it was a matter of survival, we took care of it ourselves," Vasil Shtendera says.

He selected the fields that could be cleared quickly and cheaply. However, many steps had to be taken beforehand: first of all, they had to get back on their feet economically. Therefore, it was necessary to sell the remaining pre-war harvest. However, most grain traders refused because the roads were destroyed, and the routes were unsafe. There was a lack of logistics, and the goods had to be transported a long way as Kherson had lost access to the sea. The processing infrastructure, too, was destroyed. Logistics in the region were 1.5 times to twice as expensive as in other parts of the country and transport routes were twice as long. Thus, cost-covering work was not possible.

Nevertheless, it was possible to sell part of the old harvest. With the money that was still available from the pre-war period and with private funds, Vasil Shtendera was able to close a contract for the demining of 1,500 hectares – at a cost of 7.5 million UAH (the equivalent of around 187,000 euros). A late seeding date, the 14th June 2023, was scheduled for these fields with sunflowers and soya. Without irrigation, 1.45 t/ha of soya and 1.98 t/ha of sunflowers were harvested. This harvest allowed for paying the rent for 2023.

OWN STRATEGY FOR MINE CLEARING

Testing new technologies has always been a passion of the innovative farmer. And he also developed his own system for mine clearing. The spring was wet, and the rapid weed growth made the work more difficult. Agricultural drones were used for weed control and herbicide application – a major challenge as because of the war no licences were granted for drone flights. Therefore, all work had to be coordinated with the local municipal authorities and the military. The application of herbicides had two effects: Firstly, it fought the weeds in the field, and secondly, it helped to speed up the mine clearing process and make it safer. In order to optimise the process, the villagers were involved, as they knew exactly where the troops had been and where mines or booby traps might have been laid. The fields were then searched with metal detectors. Thanks to the active help of army engineers, a further 1,500 hectares were demined by June 2024.

The state emergency service of the Ukraine reported that 156,000 km² are likely to remain mined. Mine clearing will require 37 billion dollars and over 10,000 engineers. Since the beginning of the war, 128 Ukrainian farmers have been killed by mines.

According to the Ukrainian Ministry of Agriculture, the losses in the agricultural sector have been amounting to more than 11 billion Dollars since the beginning of the war and the sum continues to rise. A significant part of the damage is due to the destruction and looting of agricultural machinery. A great deal of grain storage capacities (high silos and elevators) was destroyed, and the grain stored in them was destroyed or stolen. A smaller but still significant part of the losses can be attributed to the destruction of perennial orchards.

01

02

The price for mine clearing work in difficult areas can be up to 350 UAH/m² which is the equivalent of 350,000 UAH/ha (approx. 87,500 Euros/ha). The fields that were crossed by a line of defence are always particularly affected. In the case of Vasil Shtendera, this applied to around 1,000 hectares. Up to 300 mines per field (47 ha) were found in these fields.

The incurring costs also depend on the degree of weed infestation, the type of contamination (remnants of artillery shells or mines) and so on. For the mine clearing of these 1,000 ha, Vasil Shtendera received subsidies from humanitarian programs. There are now around 400 hectares of dangerous anti-personnel mines left.

RELIABLE CO-OPERATION AND NEW INVESTMENTS

Over the past two years, Vasil Shtendera invested over 30 million UAH (approx. 750,000 Euros) in the reconstruction of his farm. Long-standing business relationships and corresponding credit lines allowed for purchasing new machines. Before the war, he leased an 18 m HORSCH Avatar seed drill for which the financial burden, of course, continued. However, due to many years of trustful co-operation, a restructuring of the debt was arranged. He also managed to obtain a loan from a World Bank programme at low interest rates (3 to 7 %). To ensure logistics, Shtendera bought five new lorries. He also purchased a self-propelled HORSCH Leeb VL sprayer which he had already paid a deposit on before the war. For Vasil Shtendera, it is the key machine for no-till farming. For the farm needs powerful, large technology. The previous sprayer was old, and the spare parts situation was problematic.

RESTRICTED WORKING CONDITIONS

While previously the machines used to work around the clock during the season in order to make optimum use of the time windows, it is now strictly forbidden to work outside the farm premises during the curfew, i.e. between 9.00 p.m and 5.00 a.m. This considerably reduces the available time especially for herbicide application. The early morning hours from 5 a.m. and the evening hours between 5 p.m. and 9 p.m. therefore have to be planned well and utilised as efficiently as possible.

Seeding only takes place during the day. "With our powerful machines, it really worked well," Vasil Shtendera confirms. Winter rapeseed, sunflowers and soya were sown with a Maestro 24.70 SW and a Maestro 36.50 SW, cereals with the older Pronto 12 NT and the new Avatar 18.25 SD.

Rapeseed currently produces the highest yield, but it is also the most demanding crop. Rotation had to be extended in view of the available time windows. Maize was included in the rotation this year. Although wheat was less profitable, it remains one of the main crops in the fields.

The shortage of skilled labour and the lack of shelter for the equipment are further challenges. It is far too risky to overwinter the machines in a warehouse, so they still have to be hidden and secured accordingly. It is not uncommon that technical damage occurs as a result. Therefore, every detail and every button have to be checked before the start of the season. However, there is a shortage of skilled agricultural technicians for service and field work in the region.

HARVEST IN EXTREME HEAT AND DROUGHT

This year was extremely hot and dry. There were no moisture reserves. Only 50 to 60 mm of precipitation fell in the first half of 2024 while the annual average in this region amounts to around 380 mm. Because of the mine clearing, additional moisture evaporated from the upper soil layer. "Our soils have

03

not been cultivated for 10 to 15 years. This kept some moisture in the soil. Farms that cultivated their fields with a disc harrow for levelling only suffered losses," Vasil Shtendera says.

Temperatures were above 40° C for quite a long time. This often led to fires and also made it difficult for wild animals to find food. For example, 4 hectares of sunflowers were completely eaten up by hares. Because of the high temperatures, many maize cobs dried out. The result: significant harvest losses.

The fact that the fields had been left fallow for around two years also affected the harvest. Weeds were able to spread rapidly. This year, the wheat yield was 3.5 t/ha, and the rapeseed yield amounted to 2.0 t/ha.

"Because of the late seeding date, a profitable sunflower harvest was also not to be expected. In general, we started harvesting two weeks earlier than the average in previous years. I've never experienced anything like this before," Vasil Shtendera sadly reports.

Harvest itself was a challenge. The farm has its own combines and normally hires four other machines from a contractor. As many contractors did not want to come to the region because of the dangerous situation, an alternative had to be found. Fortunately, the 'Zhniva Peremohy' foundation provided harvesting machines free of charge this season.

MAIN RISKS: EXPLOSION AND FIRE HAZARDS

"Due to the drought and the high temperatures, but also in view of the ongoing attacks – we are still in a 20 kilometres zone from the front line – we also have to be constantly ready to fight fires. There have already been fires as a result of shelling and we had to extinguish them in entire villages, on our own as well as on neighbouring fields. For us, this means being on our guard every day, constantly under pressure," Vasil Shtendera states.

There is still a risk that bombs will be dropped by drones over the fields to burn the harvest or hit a combine that is currently working in the field. The farm is therefore working closely with the military reconnaissance forces in order to be warned in due time.

There is a lot at stake: on the one hand, the responsibility towards employees, landlords and lenders is high. On the other hand, the crops have to be removed from the field quickly and in good time.

In the meantime, selective measures have been taken to prevent the fire from spreading: the field boundaries were cultivated with the Tiger MT cultivator and the Joker RT disc harrow and then divided into 50-hectare strips. "This definitely saved our harvest. Of course, we also were lucky. But the main thing is that the work wasn't in vain," Vasil Shtendera emphasises.

WHY TILLAGE?

Vasil Shtendera has been relying on direct seeding for many years. As already mentioned, there are fields where the soil has not been cultivated for 10 to 15 years.

He had purchased tillage equipment like the Tiger and the Joker before the war to prepare the land for the planned irrigation system which was to be installed gradually on all fields. However, after the Kakhovka dam was blown up, technical irrigation will not be possible in this region in the long term. This primarily affects winegrowers, but also vegetable and berry growers.

01 Sunflowers are one of the key crops in southern Ukraine.

02 The leased HORSCH Avatar with 18 m working width is used for the direct seeding of cereals and rapeseed. It is the first machine of this type in the region. In October, the Avatar was heavily damaged when passing over a mine. Fortunately, the driver only suffered minor injuries.

03 The two Maestros are used to sow winter rapeseed, sunflowers and soya.

04 Dodola 2021 GmbH has been relying on direct seeding for 15 years.

Recently, Vasil Shtendera has started to use the Tiger and the Joker to prepare and level fields that were previously leased by other farmers who are now giving up their farms because they can no longer run them economically. In addition, the burnt fields also have to be cultivated after the harvest. Efficiency is important in this respect: if a cultivator is used, then it is used to simultaneously apply fertiliser (especially phosphorus) deep in the soil.

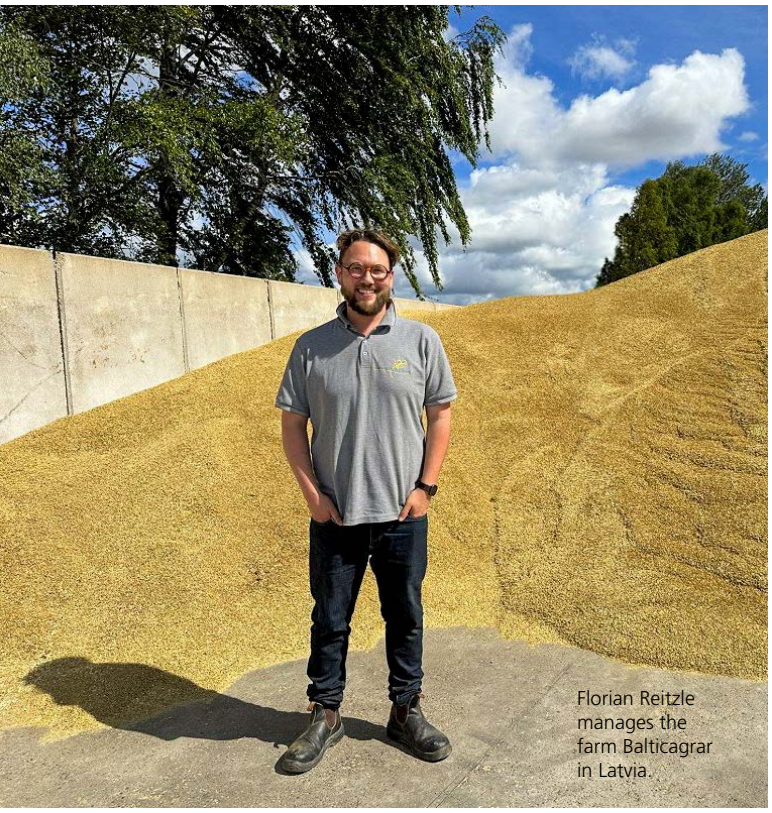
In general, Shtendera tries to maintain the soil structure and soil cover with stubble residues. Even fields with bomb craters are not cultivated. Instead, the craters are filled in with an excavator and levelled. This year, the field boundaries were also recreated digitally as the size of the farm and the field structure have changed due to the newly rented fields.

CHALLENGES AND SOLUTIONS IN LOGISTICS

Due to the farm's logistics machinery, it was possible to establish a co-operation with grain trading companies. As storing the harvest in the own grain silos still is too risky, they agreed to store the harvest with the companies and sell it as required. The production was delivered by the end of the year and then sold in batches. Thus, it was possible to keep the business running and even pay off the debt burden in 2024.

UNDER COST PRESSURE

The gold-rush mood for large agricultural farms in Eastern Europe is definitely over. Nowadays, only those are successful who have their farm under control at all levels. terraHORSCH spoke to Florian Reitzle, managing director of Balticagrar SIA in Latvia.



Florian Reitzle manages the farm Balticagrar in Latvia.

We meet the farm manager at the end of September 2024 via Teams. Florian Reitzle is relaxed. He finished sowing the day before. Now the arable farm is gradually settling down for the winter. Although a major growth step was taken only recently. "We increased our arable land from around 3,200 ha to 4,500 ha," he reports. 'We took over an entire farm which was restructured after two difficult years. All in all, agriculture in Latvia is facing changes. Many farmers are backing out. The cost trend simply no longer matches the producer prices. It is not so much the small farms with 10 or 20 hectares that are giving up, but rather the large ones with 500 to 1,000 hectares. Another problem is the farm succession. And some quite simply made unreasonable investments."

Florian Reitzle has been managing Balticagrar since 2023. He trained in agriculture and studied in Kiel and has already worked on several farms all over the world – with animal husbandry as well as with only arable farming. "My first contact with Balticagrar came about when I came to Latvia as a harvest and seeding hand during the 2013 semester break," he remembers. "I actually wanted to go to the black earth region in the Ukraine after passing my bachelor's degree. But as it was a war zone during the Crimea crisis in 2014, I turned to Latvia again. The farm had just added some additional land, and the owner wanted to retire from the operational business and had hired a farm manager. So we agreed on a fixed-term contract for one year. I came straight from university and didn't speak a word of Latvian. In the first year, I was the general dogsbody: among other things, I brought food to the fields and refuelled the tractors. From a human point of view, it was a good match. The manager soon oriented himself differently. As a result, I became more and more involved in planning issues and was allowed to make suggestions. From 2016, it was clear that I would stay. As an agronomist, I had more freedom and could try things out. Some things worked, others sometimes didn't. In 2022, the owner retired completely and handed over the management to me. However, we are always in close contact because he is not just an investor, but a farmer who wants to know what is going on the farm. I myself feel completely at home in Latvia. I have my family here and I am very happy. Moreover, Germany is only two hours away."

The employees are a major challenge. "18 people work at the farm including the owner and myself. But not all of them work directly at the farm. We have eight tractor drivers, two lorry drivers, a cook, administrative and workshop staff as well as additional harvest helpers. Our core team is great! But it's difficult to recruit more staff. School in Latvia ends after nine years. Some start to work immediately, others go to a vocational college. They rather learn theoretical stuff, but also have internships. The best thing is to offer graduates a job after their graduation and then provide them with further training at the farm. To me, it is important that I don't lead from above as it still often is the case in large farms in the East. I want us to cope with the tasks together as a team. That's why we always talk to each other and exchange information and ideas."

The year at Balticagrar

As the vegetation period is short, the machinery stock is rather generous. Balticagrar used to rely on a US tractor

01 Rapeseed blossom: the most beautiful time of the year for the farm manager.

02 The farm does not work in a "cleared" landscape. There are also hedges, groves and waters.

manufacturer. Since 2018, the farm has switched completely to Claas. They have four own Lexion combines with 12-metre cutting units.

At Balticagrar, the agricultural starts at the beginning of February. This is when the maintenance and service tasks for machines are carried out. From the first of March, Florian Reitzle turns his attention to the fields: "We start to spread mineral fertiliser. But at this time of the year, there always are sudden onsets of winter. If everything goes well, the beans are sown in the last week of March, but it usually is delayed until the beginning of April. At this time, the spring crops are sown, too, starting with the legumes. Sufficient soil temperatures are a prerequisite. If it is too cold or too wet, there is no point in seeding: the spring cereals will not gain momentum. Spring wheat is drilled as of 20th/25th April until the first days of May. Plant protection measures start in mid-April. The rapeseed blossom starts around 10th May. For me, this is the most beautiful time of the year! In June, the days are very long. We are very far up north. As of the middle of the month, it doesn't get really dark. What you have to know: the most important public holidays here in Latvia are around midsummer. Everything comes to a hold. Even in agriculture.

Then we start preparing the harvest. At the same time, we organise the spreading of lime and organic fertiliser – up to 5,000 tonnes every year. We transport them ourselves from our own harbour jetty to the field. Winter barley is usually harvested between 10th and 20th July. This is our only fodder crop, everything else is food. All of it is exported. Then we immediately continue with the rapeseed harvest. In addition, the organic fertiliser is applied, the Cruiser is used for incorporation and a second pass is carried out. Rapeseed seeding with the Focus starts on 1st August. Whether we are already harvesting wheat by then is usually not quite clear. When time is of the essence, we harvest in the morning, work with the disc harrow at midday and with the drill in the evening. This is certainly not ideal from an agronomic point of view, but it has to be done. Winter barley takes up around 5 to 10 % of our farmland. This allows us to untangle things considerably. Threshing is in full swing at the end of July/beginning of August starting with the baking wheat. For in a wet summer, the falling numbers can quickly plummet.

The harvest of the winter crops lasts until approx. 20th August. During this time, things are really cooking at the farm:

the combine harvesters are working, auger wagons are on the move, organic material is being spread, tillage is carried out, rapeseed and catch crops are sown ... There often are ten to 15 machines in the fields at the same time. My job is to keep everything running smoothly. I'm constantly travelling to and fro by car and often cover 500 km a day within a radius of 50 to 60 km. But it's also extremely important for me to keep an eye on everything. I want to know how the crops have developed on the different fields, how tillage and logistics are working.

Harvest time ends at the end of August/beginning of September with the field bean harvest. In the last days of August, the focus is on tillage, ploughing and seedbed preparation. We start drilling barley at the beginning of September. But the question always is how much land we have been able to prepare. This year, we started with two drills and were able to get 250 hectares into the ground. I try to create buffers and sometimes to change systems during the process because waiting is not an option. In this case, the house of cards collapses. Seeding mistakes are not forgiven in Latvia. What you can't do here and now, you won't be able to do tomorrow. The 2023 seeding season was disastrously wet. We caused structural damage, the roots didn't develop well and the harvest was poor. This year was much better. We were able to sow 85% in dry conditions. Rain always comes afterwards. And so far, the population is looking good. But it's still a long way to a successful harvest. However, there is little I can do over the winter. Apart from hoping that there will be no floods or heavy

The Focus is one of Balticagrar's key machines. It is used in both rapeseed and cereals.

frosts. Winter damage is always a problem in Latvia. But if I thought about it all the time, I wouldn't be able to farm here. At the end of September, one or two herbicide treatments are still in progress, especially for monocotyledonous weeds, potash is applied, fields are prepared and mulched. Shortly before Christmas, things quiet down on the farm and then work is resumed in February."

Storing the harvest is a major logistical challenge. Four combines with a throughput of 50 tonnes per hour manage 1,500 tonnes per day. The bottleneck is the drying process. The grain is first stored temporarily on a concrete slab. The continuous dryer has a capacity of 40 tonnes per hour and runs for 24 hours. On average, the grain has a moisture content of 17 to 18% at the time of the harvest. In dry years, some grain can also be stored without a dryer. The farm increased its storage capacity: three silos with 3,200 m³ each plus two halls with a total storage capacity of 18,000 tonnes. The silos were built in 2021 and filled for the first time in autumn. In February 2022, half of the rapeseed and half of the wheat were still unsold. On the day Putin invaded the Ukraine, the investment had already been amortised.

"Our harvesting capacity amounts to over 22,000 tonnes," Florian Reitzle reports. "We have to transport a large part of this directly to the harbour. But this is difficult to realise, especially when the harvest is not ideal and with regard to the current financing costs. Next year, we will work with five combines. We will probably have a capacity problem, but we will certainly solve it," the farm manager says with a smile.

Experience with HORSCH

Balticagrar has been working with HORSCH technology since 2006. In 2005/2006, there was massive winter damage and they needed a powerful drill. The Pronto was the first of its kind in Latvia. The first Leeb machines came in 2012. They were still ordered under this name but were already delivered as HORSCH Leeb. "It was a little bit difficult at first, but thanks to a great service and a lot of personal commitment – also from Theo Leeb – we got everything under control. In 2020, two HORSCH Leeb 12 TDs were delivered and in spring 2024 a PT self-propelled sprayer. The latter investment would have been difficult to manage on our own, but we were subsidised by the EU for the purchase. We now have significantly more capacity and are at the cutting edge with regard to technology.

We have been working with the Sprinter since this spring. The expansion of the land that was already in the offing tipped the scales. But also the lesson we learned from the wet year 2023 that more seed drill capacity is not a mistake. We mainly use it for direct seeding to save water. Initially, we were able to obtain a pre-series machine which we tested extensively in a wide range of conditions and finally purchased. We like the wide range of different tines, e.g. the Ultra ThinEdge 12 mm type which we use for field beans for a seed depth of up to 8 cm. For cereals, we use narrow and wider points up to 20 mm in soils that have been lightly cultivated with a disc or chain disc harrow. We only have gathered initial experience in this sector – but the crops sown this autumn look fantastic.

We use a Cruiser or a Joker with a working width of 12 metres to incorporate manure. We like the nice mixing effect of the Tiger XL for medium-depth tillage resp. the second stubble cultivation. As we work almost exclusively without a plough, we use two Terrano FM for deep, crumb-loosening, non-inversion tillage of 25 to 30 cm.

The Focus is our key machine for rapeseed seeding. We pre-loosen the soil at a depth of 30 cm and sow in a 35 cm band. I drove it for the first time in 2013 as a harvest hand. Back then, the results looked a little bit wild. After all, we came from seeding after a plough. And we didn't have the coulters we have today. Nevertheless, we continued to work with the machine. Rapeseed developed phenomenally and had a head start, so that it even made it through the winter damages of 2013/2014. This was a good financial support. It has been a given ever since! Now we're preparing the soil intensively so that we have more fine earth on top. And the steep back of the ULD coulters means that no clods are transported upwards. In a slightly modified form, the Focus also drills approx. 20 % of our cereals. We modified it a little bit with a second seed bar. It works asymmetrically at a distance of 12 to 23 cm. The idea behind it is that the roots can spread in the loose horizon. The populations close a little bit later and aerate more quickly. This results in fewer fungal diseases."

Perspectives

The impact of the war in the Ukraine is obvious. "Last year, a lot of cereals came into our harbours from there. This year, however, the impact was less. However, the biggest impact was in the fertiliser sector. From one day to the next, good quality at reasonable prices was no longer available. But this also has stabilised again."

Florian Reitzle is cautious about the prospects for the farm: "Perhaps the size of our farm will no longer be politically desirable in the future and the EU will force us to work with 1,000 ha units? As far as we are concerned, we are open to anything. But with regard to growth, we can hardly get any bigger in our structure. However, we have a high share of our own land and equity capital. We have to secure both. The same is true for the yields. We will definitely remain innovative, but we will not follow every hype. Politics remains an important factor. We would like to work without premiums and the CAP, but we can't. Our biggest challenge in 2025 will simply be to farm 1,000 ha more."

More efficient with state-of-the-art technology

Within a few years, machines from almost all HORSCH product groups gradually moved into the Gießmann farm. Jürgen Gießmann and his son Georg are convinced all along the line. In terraHORSCH, they present their farm.

Today, the Gießmann farm cultivates 600 hectares of arable land as a mere cash crop farm. It was founded in 1991 as a resettlement farm. The location in North Saxony, directly at the border to Saxony-Anhalt, is characterised by its loess soils with an average soil index between 80 and 82 soil points.

In the early days, the farm employed up to six people at times as there also was a bull fattening branch with 100 animals until 2003. However, this has changed considerably. Today, with two family workers and one apprentice, a well-equipped machine park is particularly important during work peaks. Tight time slots are compensated for with powerful machines instead of seasonal labour.

While other regions in Germany had to struggle with massive rainfall and storms this year, the Gießmanns were largely spared. "In the last ten years, rainfall amounted to an average of just over 500 mm, including the dry years of 2018 to 2020. We are in the rain shadow of the Harz. That is both a blessing and a curse," farm owner Jürgen Gießmann explains. Most of the land has been drained in GDR times and the drainages still work today. This has been a great advantage, especially with the increasing heavy rainfall in recent years. The water can

01

02

01 The Gießmanns see great advantages in hybrid farming.

02 The Gießmanns achieved good results by converting to single grain technology for rapeseed.

Due to the proximity to the HORSCH Centre in Sietzsch, there is the opportunity to test machines from time to time – like here the Titan during the harvest.

In November 2024, the Leeb 12 TD crop care sprayer arrived on the farm to further increase efficiency.

drain off. There is no waterlogging in the fields that could lead to yield losses. While 30 to 40 years ago, the average rainfall was 480 mm, it is now over 500 mm. "Despite the higher rainfall, we have to struggle with dry periods to an increasing degree," Georg Gießmann says. Although the amount of precipitation has increased, the distribution over the year has become more uneven. Whereas normal rain showers used to be distributed over the year, storms now bring 10 to 20 litres of rain per square metre within half an hour followed by weeks of drought and high temperatures. This was once again the case this year. The grain harvest was brought in dry, followed by a period of rain at the beginning of August. After that there were five weeks of drought, characterised by extreme heat and strong easterly winds when rapeseed was sown. "The consequences can be seen in the winter rapeseed which emerged with a significant delay but has now recovered well," Georg Gießmann says.

CASH CROP CULTIVATION AND OPTIMISATION

The Gießmanns' main crop is winter wheat, mainly as A wheat on half of the fields. In addition, silage maize is grown for a nearby biogas plant and sugar beet has been grown on a constant area for 33 years. As rapeseed cultivation has been rather difficult in recent years with regard to pest pressure and drought, they decided in 2023 to reduce the area under rapeseed. It was replaced by sunflowers to keep up the share of oilseed crops in the rotation while at the same time coping better with the dry, warm climate. In addition, since this season, they started a co-operation with a neighbouring farm for potato fields to expand the crop rotation.

The land is largely cultivated with the mulch seeding method to preserve resources, particularly with regard to the water balance. The plough is only used where it is really necessary, e.g. for winter barley after winter wheat. However, after having changed the rotation this year, the plan is to do completely without a plough in the future and move towards minimum tillage. To this end, large-scale tests have been set up which showed that soil cover is very advantageous, especially with regard to dry periods. "However, we will not get around deep loosening, especially in crops that require a deeply loosened root horizon. That's why we use two different Terranos on our farm," Georg Gießmann explains.

HYBRID FARMING

For the Gießmanns, mechanical plant protection is not only important for sunflowers where they gathered good experiences this year. It all started with a demonstration of the harrow Cura 12 ST. Without any background, a couple of tracks were harrowed in the winter wheat population and the measures the farm usually carries out were continued until the harvest. The surprise came on harvest day when the yield maps of the field were analysed. The yield on the harrowed land was up to one tonne higher. "This was the point where we decided to buy our own Cura to pursue the idea further," the Gießmanns remember. Since then, they have continued to test how the harrow can be used in an optimum way. While initially only smaller test plots were harrowed, they decided to expand this. Last year, "herbicide-free until harvest" was the idea for one wheat field. The field was prepared with the mulch seeding method and the harvest residues were incorporated well. Because of the difficult seeding conditions last autumn, the first harrowing pass could not be carried out until the beginning of November. In spring, the intensive incrustation caused by the heavy rainfall in the autumn was broken. The last harrowing pass was carried out at the end of March. In the course of the stem extension phase, it was discovered that some of the fumitory and camomile had not been fought efficiently, and the Gießmanns decided to carry out a herbicide treatment. "The test may not have been perfect, but for us, it was a complete success. The wheat variety which is known to be susceptible to all kinds of diseases was very healthy, and we were able to save on fungicide treatment. Moreover, this field is located in a nitrate-polluted area which is why only 80 percent of nitrogen fertilisation was applied in accordance with the fertilisation recommendation. The result speaks for itself: the yield and quality of this field were above this year's average for our wheat fields," Georg Gießmann explains.

CONVINCED ALL ALONG THE LINE

"Starting in 2017 with the delivery of the first HORSCH machine, a Pronto 6 DC, the entire fleet has been converted to the red machines from Schwandorf," Jürgen Gießmann says.

The HORSCH Centre Sietzsch which opened in 2017 is located in the immediate vicinity of the farm. "They provide an excellent service and expert advice". At the same time, they had the opportunity to test many machines, test drive them and compare different seeding methods. Important aspects that have contributed to the fact that a large part of the technology now comes from HORSCH. After the purchase of the Pronto 6 DC which is still doing a reliable job, a Joker 6 RT, the Terrano 6.4 GX and the Terrano 3 FX followed. The latter is mainly used for deep loosening of tracks and before rapeseed. Equipped with the ULD points, it loosens at a depth of up to 35 cm without changing the soil horizons. The organic material remains on the soil as a sun protection and compactions are removed so that for example the rape plants can root deeply into the soil without any problems.

The Cura 15 ST and the Maestro 12 CX were added to the machine fleet in 2022. The Maestro was chosen primarily because of the conversion to single-grain rapeseed seeding. Maize, sugar beet and sunflowers will also be singulated – all with a row width of 50 cm. In November, the Gießmanns were once again full of anticipation. At this year's "40 years of HORSCH" event in Schwandorf, they had bought a new Leeb 12 TD crop care sprayer which was delivered a few weeks ago. "It may be a little bit oversized, but we want to take advantage of the ideal point in time and thus bought ourselves some free time," Georg Gießmann explains. The opted for a larger tank capacity as plant protection measures were postponed to the evening and night hours in recent years because of windy conditions and excessively high temperatures. At the same time, all the nitrogen fertiliser on the farm is applied in liquid form which provides greater efficiency, especially in early spring.

Within seven years, HORSCH machines from almost all product groups moved in with the Gießmanns. "In our region, our farm is rather small, but we are still very well equipped with regard to technology," Jürgen Gießmann says. Their aim is to make use of the perfect time for all work steps. This is why the farm became very well mechanized with own machines in recent years.

Georg (left) and Jürgen Gießmann (right) on the occasion of the delivery of the new Leeb 12 TD.

Since the purchase of the Pronto 6 DC in 2017, machines from almost all product groups have been following.

SUCCESSION AND INVESTMENTS

At present, the division of the work on the farm is relatively clear. Jürgen Gießmann takes on the tasks in the office. This includes daily office work as well as agricultural applications, bookkeeping and rotation planning. Georg is mainly responsible for the arable farming part from seeding to harvest logistics. However, his responsibilities also include the social media presence and, above all, digitalisation on the farm, e.g. yield evaluations and the planning of site-specific seeding and fertiliser maps. They are supported by one apprentice. A major step that will be taken in the next few years is the succession of the farm. Georg will be taking over the business from his father, something that has always been clear to him. "For me, nothing else has ever entered the equation. It was clear to me right from the start that I wanted to do it," he says. As far as the size of the farm is concerned, no changes are planned for the time being: "We don't want to expand. We prefer quality over quantity," Jürgen Gießmann says.

With regard to technology, things are a little bit different. More machines already are on the wish list. For one thing, a hoe, the Transformer 6 VF which the farm had rented this year, has convinced them completely and will be integrated into the farm machinery in the new season. Moreover, they also had the opportunity to test a Focus and were positively surprised. Compaction horizons could be removed and soil additives as well as seed could be applied in one single pass. This allowed for saving work steps and making better use of the soil moisture. "Being a small farm, we want to do without additional external labour. This is why we really like concepts like this."

"Together we are strong" is how the Gießmanns describe their cohesion and they will continue to pull together in the coming years. They want to continue to optimise work processes and test and implement new ideas.

SCHOOL PROJECT KIDDOS:

COMMITMENT FOR THE FUTURE

Education plays a fundamental role in a child's development and future providing the foundation for intellectual, emotional, and social growth. Cognitive development, social skills, self-confidence and self-esteem are among the many skills to be learned and developed by education. For this reason, the HORSCH branch in Brazil decided to invest in the children of its employees to ensure a good education.

The KIDDOS project gives children access to a better education and opens up new prospects for the future. The children of Celso Quintiliano (head of quality management) also benefit from the project.

The quality of the Brazilian educational system differs considerable from the standards in European countries. Data from official organisations, such as the Basic Education Development Index (IDEB), reveal that despite significant progress in recent years, public education in Brazil still faces profound challenges. Charts from the Ministry of Education show that the average IDEB score for public schools in Brazil falls short of expectations, often below the desired level for quality education. Among the 81 countries participating in the PISA studies (Program for International Student Assessment), Brazil ranks 65th in mathematics, 52nd in reading, and 62nd in science.

In contrast, countries like Germany offer a structured educational system that combines universal access to high-quality schools with solid financial support for families, such as Kindergeld (child benefit). This aid, amounting to 250 Euros per child per month, represents a significant investment in the future of the next generation.

Kick-off for the project

In view of this background, HORSCH do Brasil launched the project KIDDOS. CEO Rodrigo Duck explains how the idea came about:

"During our one-year stay in Germany, we were impressed by the efficiency of the educational system which not only ensured quick learning but also provided an inclusive and stimulating learning environment. This experience led us to reflect on the educational reality in Brazil. While my oldest daughter, Eliza, quickly adapted to the German school system – even though German is not her native language – we noticed a strong contrast to what we were used to in our country. In Brazil, public education faces severe resource and infrastructure limitations, and many families, including our employees, cannot afford the costs of a good private education. In this context, we decided that upon returning to Brazil, we would look for a

01

02

01 The objective of the project is to support the development of children and adolescents. Thus, the children of Luiz Carlos Braga (quality management) are provided with completely new opportunities for their education.

02 With the project KIDDOS, Rodrigo Duck wants to improve the educational opportunities of the children of the employees of HORSCH do Brasil and, thus, encourage a positive development in the long run.

03 The premises of HORSCH do Brasil.

school that fits more restricted financial values – we selected a Mennonite school for 200 Euros per child per month which offers a satisfactory educational level, although many options may be financially unreachable for most of the population. Currently, considering that most of the employees in the agricultural sector earn an average salary of 500 Euros, the monthly cost of a good school can be a heavy burden. After a promising financial year in 2021, we decided to develop a project focused on the education of our employees' children. We realised that investing in their education would not only provide a better future for these children but also encourage a personal development that could, one day, reflect in our company. These children could become future employees at HORSCH, benefiting from the programs we offer for young people and teenagers."

Holistic support

The KIDDOS Project is a transformative initiative aimed at sensitising children and young people to civic responsibility and encouraging integral development. HORSCH is committed to offering education that goes beyond academic knowledge, incorporating fundamental principles and values that guide life in society. The company co-operates with the families with regard to the selection of educational institutions that meet the quality and accessibility criteria, prioritizing those in line with the company's values. The tuition fee is around 200 Euros, though private schools can charge up to 1,000 Euros per month.

KIDDOS is to ensure that children and young people acquire, from an early age, a comprehensive understanding of citizenship, social justice, respect for others and responsibility. The project is built on the belief that a promising future has to be based on a solid foundation, supported by ethical and inclusive education.

The participants should not only develop technical skills but also human values that will accompany them throughout their life. KIDDOS provides a safe and welcoming environment where every child and young person can express themselves, learn to respect differences and understand the importance of diversity.

In addition to the educational aspect, the project also is aimed at involving families and the community, strengthening bonds and promoting a network of mutual support. HORSCH is convinced that co-operation is essential for the success of human development where individuals, equipped with knowledge and strong values, are ready to become proactive citizens committed to building a better world.

In summary, the KIDDOS Project is more than just an educational offering: it is a commitment to the future with the objective to support the development of children and young people so that they become mature, reliable, responsible and socially competent citizens. Together, we shape the future and prepare our young people to play a leading role and to bring about a change.

03

Apprenticeship with perspective – apprentices from Latin America

From El Salvador to Germany – young people from Latin America embarked on this journey to start an apprenticeship in Germany. They left their home country to lay the foundation for a better future. A courageous step that offers many opportunities.

The apprentices from El Salvador together with the head of apprenticeship Anton Grauvogl (left) and mentor Maria Elena Armas Mondragon (3rd from the right).

In 2023, a special apprenticeship project was launched to offer young people from El Salvador career prospects in Germany. The project was initiated in co-operation with the Weiden Employment Agency and the International Placement Services. In addition to HORSCH, other companies from the Northern Upper Palatinate region participate in the project.

PERSPECTIVE IN GERMANY

El Salvador, a small country in Latin America, is characterised by poverty, gang terror and crime. Therefore, many young people see a career opportunity abroad as a chance for a better life. "Germany offers stability, a high quality of life and a well-developed system while El Salvador faces major economic challenges," Carlos explains. He started his vocational training as a production mechanic at HORSCH in 2023. Carlos was one of three young people who decided to start an apprenticeship in Germany after an intensive application process. The virtual application phase revealed the difficult living conditions of the candidates: some of them attended the interviews in simple shacks.

In August 2023, Carlos, Luis and Kevin set off for Germany. While Kevin started vocational training as a technical product designer, Carlos and Luis started their apprenticeship as production mechanics. All three of them already had previous technical knowledge and a good command of the German language which made it easier for them to get started. They had also taken part in a program in their home country that prepared them for life and culture in Germany. Despite this intensive preparation, the start was rather challenging. Language was one of the biggest obstacles. But in this respect, too, they got support.

Although she is fluent in Spanish, Maria tries to speak only German with the apprentices to develop their language skills.

A colleague who does some volunteer work gave German lessons after work.

SUPPORT AND INTEGRATION

An important mentor for the boys is Maria Elena Armas Mondragon who trains as an industrial management assistant at HORSCH and is fluent in Spanish. She also supports the boys with regard to visits to the authorities and organisational matters and is enthusiastic about helping her colleagues. "I make sure that we mainly communicate in German even if it was difficult for the boys at first. If necessary, we switch to Spanish," she explains. Socialising with the other apprentices is also important – both for the language skills and for integration.

The contact with Maria and her family helped the boys to settle into her new home. "One highlight was when Luis, Kevin and Carlos had dinner with my family and me. As we are also Latinos, they felt a bit closer to home," Maria says.

As the experiences of the first round were very positive, the project continues. While Luis, Carlos and Kevin started their second year of apprenticeship, three more young people from El Salvador, René, Alan and Richard, came to Germany in 2024. Once again, Maria is fully integrated into the process and supports her new colleagues.

René and Richard started an apprenticeship as production mechanics while Alan decided to train as a warehouse logistics specialist. "It was a difficult decision to leave my life in El Salvador behind, but I knew it was the best decision for my personal and professional development," Alan says. The other apprentices also share this point of view. They consider an apprenticeship in Germany to be a great opportunity – even if it is a big step.

INCLUSION IN EVERYDAY WORKING LIFE – A PROJECT WITH A FUTURE

Inclusion means breaking new ground together. At the beginning of the year, HORSCH LEEB started a co-operation with the Landshut Sheltered Workshops to integrate people with disabilities directly into the regular labour market.

Inclusion is not just a concept at HORSCH, it is actively practised in everyday life. At the end of last year, for example, a joint project with the Landshut Sheltered Workshops was launched in Landau. They prepare hoses for HORSCH LEEB in various colours to the length specified in the order. The objective was to intensify this co-operation even further and to integrate people with disabilities directly into the company.

After several discussions with the responsible parties on both sides, a so-called external internship was created in the company. Michael, a committed colleague from the Landshut Sheltered Workshops, was recruited. He has been a permanent member of the HORSCH LEEB team since the beginning of the year. He takes on various tasks: Among other things, he ensures that the high-visibility jackets for visitor groups are properly distributed and hung up again after use, and he takes care of the supply of consumables. On Mondays and Wednesdays, he distributes fresh fruit in the departments – an activity that brings him into contact with many colleagues. He also provides active support with numerous tasks, for example in the canteen and with regard to maintaining the garden beds and lawns.

"He carries out all of this independently and with visible pleasure," says Heidi Spranger who is in charge of this project at HORSCH LEEB and coordinates his tasks. She adds how important it is to respond to his individual needs and is pleased that Michael has become more and more independent. Michael himself is also very satisfied: "I really enjoy the work. I've been very well received. What I like most is that everyone accepts me for who I am," he explains enthusiastically.

Currently, Michael is working for HORSCH LEEB six hours a day. After that he continues to work at the Landshut Sheltered Workshops. This vocational rehabilitation program ends in February 2025. Then there is the possibility of an external job. "This is always the big objective of everyone involved," Heidi Spranger explains. Michael would then also work full-time at the company. By now, his support has already become indispensable: "When Michael is on holiday, he is really missing and a lot of things that you might not have had on your radar fall by the wayside," Heidi Spranger emphasises.

Future potential

'Recognising people and their talents, integrating them and building good teams – that's important to us. We also take unconventional paths to achieve this. If origin and particularities become irrelevant in everyday life, we have gained so much with regard to a good co-operation – and it is really constructive for all of us to achieve a lot of things with our diversity,' Judith Ehmann-Leeb who initiated the project emphasises. Building a team is also important to Heidi Spranger: "We fully integrate Michael into our team. He is treated and valued by everyone like any other colleague.'

In the future, HORSCH LEEB would like to expand the co-operation with the Landshut Sheltered Workshop to give even more people with disabilities the opportunity to participate in the regular labour market. The positive outcome has shown that inclusion does not only work at HORSCH but also provides a sustainable added value for the company and its employees.

Heidi Spranger (left) is in charge of the co-operation with the Landshut Sheltered Workshops at HORSCH LEEB.

Stefan Dengl, Group Leader of the Vocational Rehabilitation Centre at the Landshut Sheltered Workshops:

„From the Landshut Sheltered Workshops' point of view, the inclusion project is a success. In the vocational rehabilitation courses, Michael reports enthusiastically about his work at HORSCH LEEB. We also noticed some very positive changes: Michael has become much more self-confident, structured and balanced.

The Landshut Sheltered Workshops hope that the project with HORSCH LEEB will be expanded further and that more of our employees can benefit from these positive experiences."

Distributing high-visibility waistcoats for factory tours is just one of Michael's many tasks.

HORSCH Foundation: Together for humanity and solidarity

The non-profit HORSCH Foundation was established in 2006 with the objective of promoting social commitment and making a contribution to overcoming poverty in the world. Since then, numerous projects have been realised and many positive things have been achieved. In terraHORSCH, we take a look at current projects.

01 The METROPOL in Schwandorf serves as a meeting place – everyone is welcome there. It is intended to be a place of progress, exchange and social cohesion.

02 The METROPOL was officially opened on 28th October 2024.

PROJECT EMMA

EMMA is a non-profit association that supports socially disadvantaged people with second-hand clothing and encourages the integration of people with special challenges. What makes EMMA special: anyone can shop there, regardless of their social situation. Those in need receive a 50% discount to facilitate their access to affordable clothing. Week after week, volunteers ensure that the clothes are sorted and that the shops run smoothly.

Sustainability is a top priority at EMMA: Clothing is not seen as a disposable item but as a resource that can bring joy to others. The EMMA shops in Neunburg vorm Wald and Schwandorf have been important points of contact in the region for many years. A third branch was opened in Gera in August 2024. EMMA stands for humanity, respect and equal treatment because everyone is welcome. With the support of the HORSCH Foundation and the 'Integration Schwandorf' association, EMMA contributes to an inclusive and sustainable society.

A MEETING PLACE FOR TOGETHERNESS

In the building of the former Metropol cinema in Schwandorf, a new place of welcome has been created to encourage encounters and exchange between people of all ages and backgrounds. The project is also backed by the 'Integration Schwandorf' association which created this open meeting place with the support of the HORSCH Foundation under the motto 'Living together'.

The METROPOL is a central point of contact where a wide range of services are bundled. For example, there are free German courses for mothers while their children are being looked after. Schools, organisations and clubs can also benefit from targeted support for various activities. The large hall in the METROPOL with its stage and screen provides ideal conditions for lectures, seminars and creative projects. A converted and fully equipped flat on the upper floor allows for caring for small children and for realising early childhood projects. The objective of this inner-city social project is to strengthen social cohesion, to help people advance due to education and exchange and to further develop the project work of the sponsoring association.

SUPPORT IN THE UKRAINE

The HORSCH Foundation also provides active support in the Ukraine. At the request of a HORSCH employee from Schwandorf, the foundation provided financial support for the National Pedagogical University of Poltava. Refugees are cared for and accommodated in the university's student residences. The Foundation also supports local organisations that provide practical help. These initiatives supply the population with food parcels, for example, and take care of medical care and wound treatment. One organisation organizes trainings for trauma therapists to help people deal with their experiences of war, flight and fear.

HORSCH BY CONVICTION – A FAMILY BUSINESS WITH A VISION

From a blacksmith's shop to a dealer of state-of-the-art agricultural technology – Wölfleder Bernhard GmbH can look back on a 300-year tradition. By conviction, the family business has been selling the HORSCH brand since 2021. A courageous step that started with a simple phone call.

The Wölfleder family business in Zell an der Pram (Upper Austria) has a long history that dates back to 1702. It originally started as a blacksmith's and horse shoeing shop and then gradually developed into a major dealer for agricultural machinery in the region. The company first sold Steyr tractors. In the workshop which was expanded in the 1960s, they repaired both agricultural machinery and cars.

Over time, however, it became apparent that this combination at one location was not ideal. In 1988, the family therefore decided to split the company. A car dealership with workshop was built in a nearby village while the agricultural machinery company remained at the original site.

Michaela and Bernhard Wölfleder are the third generation to run the agricultural machinery business.

The HORSCH Field Day in August was a complete success.

The company is characterised by a good and familiar working atmosphere.

Passion for agricultural engineering

Bernhard Wölfleder, the youngest of four siblings, deliberately decided in favour of agricultural machinery while his brother took over the car dealership: "He was interested in fast cars, I was more interested in agricultural machinery," he explains. In 2007, he took over the agricultural machinery business together with his wife Michaela and is now the third generation to run it. Right from the start, it was important to him to set his own priorities and develop the company further. This initially included controlling, but he also wanted to take a different path with regard to the machines: "I wanted to do something new, machines that others don't sell. So, after a long history of Steyr tractors, we introduced the Claas brand. Despite many doubts from those around me, I went through with the brand change because I knew it was the right thing to do." The brand fascinated him from an early age, especially the combine.

The decision to include Claas in the portfolio proved to be spot on. The official sales partnership with Claas followed in 2011 laying the foundation for the successful establishment of the brand in the region. This year thus marked the start of the success story. Due to the positive response from the customers and the continuous development of the product range, the company grew steadily. In 2016, the company premises were expanded by two halls to a total area of one hectare. In 2019, the warehouse was expanded within the scope of a conversion project to provide customers with the optimum supply of spare and wear parts. For customer satisfaction ranks first.

Start of the co-operation with HORSCH

In 2020, a new opportunity arose, and the start signal for the co-operation with HORSCH was given: "It all began with a call from HORSCH asking whether I would be interested in selling their products," Bernhard Wölfleder remembers. "I have always liked HORSCH machines, but such a big decision had to be well-considered and could not be taken lightly because it also meant a big investment for us," the Managing Director explains.

The more he familiarised himself with the brand, the more enthusiastic he became about the company and its philosophy. "At some point, I watched a video of Michael Horsch, then watched it again and again and was impressed. He simply sees things differently and that fascinates me. He wonders how we can treat nature with respect and then develops the corresponding machines. A particularly likeable aspect is that the whole Horsch family always seeks direct contact with the

Major importance is attached to an excellent service. This is why employees are out and about visiting customers with several workshop vehicles during the season.

customers. This is not the case with any other company. I really appreciate the short distances and direct communication and hope that it will stay that way for a long time to come. We Austrians have always enjoyed being with the Bavarians,' he adds with a smile.

"When I met Michael Horsch, I was impressed by his story. What he has already experienced – from his beginnings to today. He has always believed in his vision. And that's exactly how we are. When I sell something, I have to experience it and know how it works. It has to be authentic, and I have to identify with it. Only then can I pass this conviction on to the customer."

Bernhard Wölfleder did not want to make the decision to include HORSCH in his portfolio without the feedback of his customers: "I invited ten of my best customers to an evening event where Philipp Horsch was also present and talked about the brand, the company and the products. The feedback was overwhelmingly positive, and the customers became real fans. After that it was clear: HORSCH is a perfect match. I was very impressed by the way the company approached us and how everything proceeded right up to the final decision." And so the HORSCH brand was officially added to the portfolio in 2021 – another big step for the company.

Machines that impress

The first HORSCH machine Bernhard Wölfleder sold was a Terrano 3 FX. "Terrano and Joker are our best sellers. Once a customer has driven this machine, you don't need to argue much more," the Managing Director says. However, the product portfolio is diverse and the demand for machines such as the Cruiser or seed drills like Versa and Pronto is constantly increasing. "We have also started selling Maestros and sprayers. On average, the farm size in the region amounts to 30 ha. Therefore, investments in crop care sprayers are often made by machinery cooperatives."

To provide customers with the best possible advice and to be always up to date, major importance is attached to the continuous training of the entire workforce. "We organise training courses on an ongoing basis so that we can delve deeper and deeper into the matter as the machines are becoming increasingly complex. This is the only way we can provide our customers with the best possible support. Last year, for example, two of our employees were on site at the sprayer training courses in Schwandorf."

Good service is also important to Bernhard Wölfleder. With five fully equipped workshop vehicles, the employees travel directly to the customers to carry out service works or repairs. The latter is particularly essential during the season and emphasises the company's customer focus.

Potential in the region

"We have a high density of dealers in the vicinity. That's why you need a different brand portfolio. I consider this to be a huge opportunity." The agricultural potential in terms of hectares is certainly available in the region. It often happens that customers actively ask for the HORSCH brand. "Now there is finally someone who sells HORSCH! We often hear that," Bernhard Wölfleder says.

Many farmers and visitors took the opportunity to take a closer look at the machines.

Increasing the visibility of the HORSCH brand in the region is a central objective for the coming years. "Of course, it takes time for everyone to realise that we offer HORSCH, but quite a lot has already happened in the last three years, and we continue to see great potential,' he states optimistically.

A special highlight for the whole company was the HORSCH Field Day in August 2024 where twelve machines were presented on a large field nearby. The demonstration attracted numerous farmers and interested people from the region and gave them the opportunity to see the machines live and in action as well as to get information and exchange ideas and experiences. Kurt Glück from the HORSCH Marketing team presented the machines and explained the advantages of the respective technology to the farmers.

Family business

Under the management of Michaela and Bernhard Wölfleder, the company has grown steadily. From five employees in 2007, the Wölfleder Bernhard GmbH has developed into a company with 23 employees. Apprentices are also part of the team and are trained as office management assistants and agricultural machinery technicians.

Michaela and Bernhard Wölfleder attach major importance to a familiar working atmosphere and a strong team spirit. "It is important to us that our employees enjoy their work and that the atmosphere in the company is good. That's a priority for me as the Managing Director," Bernhard Wölfleder explains. Michaela adds: "We particularly appreciate the assets of our employees because we have only achieved what we have today by working together. And not a day goes by without our colleagues standing together after work, chatting and exchanging ideas."

The working atmosphere and the support of the team are the foundation on which the Managing Directors want to continue to develop further. A decisive course has already been set for the future. Planning is underway and the Wölfleder Bernhard GmbH would like to take the step towards expansion in due course. This path once again requires courage and commitment – qualities the family business has already demonstrated on several occasions.

A successful event: almost 900 farmers and dealers took part.

Field days in France: another great success

The field days "Journées de la Lucine" are held every two years at the HORSCH France headquarters. As always, the program of the event that takes place at the beginning of September with a successful mixture of machine demonstrations, interesting presentations and exchanges with customers and sales partners. Almost 900 participants travelled to La Lucine near Châteauvillain, France.

The agenda was varied: top-ranking, international speakers and an excellent organisation. Moreover, it was also possible to exchange ideas with the Horsch family. Michael, Cornelia and their second eldest son Constantin had come to France for the event. The somewhat moody weather did not affect the general atmosphere, and the Field Days 2024 were also marked by the company's 40th anniversary. In the exhibition hall, the guests were given an insight into the history of HORSCH.

SPEECHES AND DIALOGUE

The choice of topics at the event reflects the DNA of the HORSCH brand: "There is a solution for any new problem". It is precisely this philosophy that the company wants to convey with its new claim which was presented in July: 'WE WILL FIND A WAY.". "HORSCH is active on an international scale. That's why we decided to use an English claim," Cornelia Horsch, Marketing and Sales Manager of the HORSCH Group, said in her introduction. "The new claim illustrates our ambition to tackle current and future challenges in agriculture together with our customers, partners and employees and to find sustainable solutions for any task," she emphasises.

As the largest export market, France is an important starting point for innovations as French farmers constantly look for new technologies and ideas to make their systems more durable and efficient. This was also confirmed by the experience report of Fabrice Lugnier, a HORSCH customer who contributed to the development of the Avatar in France.

The program of the two lecture mornings remained true to the brand's philosophy: macroeconomic and sociological analyses, exchange of agronomic findings and experience reports of customers from the agricultural sector as well as an open and intensive exchange with the audience.

MACHINES AND INNOVATIONS IN THE SPOTLIGHT

Because of the rainy weather, the afternoon program was adjusted accordingly with an extended demonstration. Nineteen machines were presented to the enthusiastic participants. There were innovations in the sector of shallow tillage, for example, with the expansion of the Finer series with a trailed 8 m version and the introduction of large 580 mm discs for the Joker RT and CT line. A prototype of the new Joker 12 CC disc harrow and the new Sprinter CO impressed in the field – as the weather cleared, they could eventually be shown in action. In the precision seeding sector, the participants saw the latest Maestro 6 AX 3-point seed drill for compact four-cylinder tractors and the Maestro 12.75 CX. In the field sprayer sector, the HORSCH Leeb range was presented: the Leeb LT field sprayer as well as the two self-propelled sprayers Leeb PT and VT. The new generation of the front tank Partner 2.1 and 2.5 FT with a capacity of 1,700 and 2,500 l were met with great interest by the visitors present as they can be used as a seed combination, together with precision seed drills, cultivators or hoeing machines to spread several products.

DAY 1 – DEPENDENCIES AND CHALLENGES IN THE ENERGY SECTOR: HOW CAN THIS BE SOLVED?

'There are only 1 billion hectares of arable land for crops to feed more than 9 billion people in 2050. Yet yields are stagnating or even declining, and the climate problem is increasing. To solve this problem, we need constant innovation with and for all farmers, regardless of the structure and size of their farm,' Michael Horsch said.

The same is true for energy resources. Like all other economic sectors, agriculture has to realise the challenges that have to be coped with: namely replacing oil, gas and coal with renewable energies within 30 years. Benjamin Louvet, commodity expert and asset manager at OFI AM, explained the background of the oil markets (production areas, different oil typologies, geopolitical challenges) and the challenges of the energy transition with regard to energy dependency and costs. Crude oil is still the most important source of energy, with an extraction peak by 2028–2030.

Hydropower has already reached its maximum potential. With regard to nuclear energy, it will not be able to cover the world's entire energy needs. The rapid development of renewable energies, solar and wind energy therefore remains the way preferred by the politicians to accelerate the energy transition and meet the objectives of the Paris Agreement. Our dependence on fossil energies is therefore turning into a dependence on metals: "Between 950 kg and 5 t of copper are required to build a wind energy plant. [...] Six times more rare metals are required to build an electric car than to build a car with a combustion engine," Benjamin Louvet explained. Therefore, we will have to get used to paying more for energy over the next 10 to 20 years. For the extraction and processing of raw materials remains lengthy and expensive. In view of this macroeconomic reality, farmers will have to capitalise on the opportunities of self-production and self-consumption by producing green energy like biogas, agrivoltaics and wind power. Benjamin Louvet also emphasised the role of the public authorities: "To successfully shape the transformation of the energy sector, the government has to make targeted investments and provide subsidies."

For Maximin Charpentier, farmer and Chairman of the Chamber of Agriculture of the French Grand Est region, agriculture will be one of the most important players with regard to decarbonisation in the future. He particularly emphasised the opportunities of farms for producing biomass. An idea he pursues as part of the Terrasolis project. "This could be a goldmine for agriculture. So far, biomass has been bought up and utilised by large corporations at low cost. We can also do this ourselves. We live in a disruptive

The machine show was a highlight of the day: 19 tractor-machine combinations were presented.

world. My objective is to find and implement solutions for future generations."

The morning ended with an agricultural science presentation by Prof Dr Bernhard Bauer from the Weihenstephan-Triesdorf University of Applied Sciences. He proposed solution strategies for drastically reducing the resistance of black grass and ryegrass in cereals by means of a combination of rotation, chemical plant protection and tillage strategies, such as false seeding. In addition, a good understanding of the modes of action and half-lives of the active agents still available to us is required. Dr Bauer showed some ways for the application of herbicides.

DAY 2 – FARM ORGANISATION: KEY CHALLENGES

In addition to the decline of the number of people working in agriculture, the increase of the farm size, economic, legal and personnel problems (framework conditions, recruitment), farms are confronted with more and more complex realities. The first speaker on the second morning of the Journées de La Lucine was François Purseigle, sociologist at the Polytechnic Institute of Toulouse and research associate at the Sciences Po University in Paris, who provided important insights into the social realities of running a farm. "A whole new chapter in agricultural history is being written at the moment. It is therefore crucial to carefully analyse the social and economic processes to find not just one, but several solutions for farms which today are much more diverse,' he stated as an introduction. For even if public opinion and politics in France nostalgically cling to small, artisanal farms, today's French farms are no longer those of the previous generation. This collective fantasy world stands in the way of a professional and entrepreneurial view of modern agriculture.

In view of the foreseeable rise in energy prices over the next 20 to 30 years, Benjamin Louvet called on farmers to make use of the opportunities offered by self-production and public subsidies to expand renewable energies.

> "Every decade brings new challenges. My job is to develop a solution to keep my team motivated and my business profitable today and in the future."
>
> James Peck

BETWEEN POPULATION DECREASE AND CHANGES IN THE FAMILY MODEL

The first observation is unequivocal: the number of French farmers is declining, with the livestock sector being the most affected (30,000 to 40,000 dairy farmers in the forecasts for France by 2030 compared to 250,000 in 1980). Half of the French farm managers will be of retirement age by 2030.

Second observation: a farm no longer is just a family affair. Even if family labour (siblings, parents, spouses...) have kept the farms going for a long time, there has been a 55 % decline between 2010 and 2020.

This jeopardises the country's production capacity and finally its self-sufficiency. "We can't say that we didn't know," François Purseigle repeated several times calling on politicians and farmers to find solutions together and quickly.

Agricultural production is an economic activity like any other. The "do it together" model of traditional agriculture (with the family, in a group of farmers etc.) is developing into a "have it done" model forcing farmers to rethink their methods. From an economic point of view, the expansion of the farms and the use of labour outside the family are now an indisputable reality. The farmer is a business manager who relies on labour. There are currently 930,000 employees (directly or via contractors) working on French farms. This represents an increase of 71% in the number of employees of contractors and 249 % in the number of employees of employers' organisations. This non-family labour force will grow to over 1 million employees by 2030. This will have consequences on the profitability and the continuance of agricultural farms.

When asked by a farmer from the Aube department about the "huge gap" between politics and the economic reality of the farms and the challenge of finding an agricultural strategy, François Purseigle replied: "French agriculture is a fantasy, it is idealised and not seen as it really is. This leads to a rift between farmers and decision-makers. The real challenge is to look at farming families from an economic point of view – regardless of family relationships".

SIMPLIFY AND DIVERSIFY: THE SECRET TO LONG-TERM FARM SECURITY?

The next speaker was the British farmer James Peck. He founded his business PX Farms Ltd in 2003. "My motto: innovate, adapt and excel. Every decade brings new challenges. My job is to develop a solution to keep my team motivated and my business profitable today and in the future," James Peck said introducing his philosophy which is modelled on that of Michael Horsch. His farm consists of three sites and covers 5,100 hectares. To cultivate the fields, distances of up to 150 kilometres have to be covered which includes a considerable logistic effort. Since taking over the family business in 1999, James Peck has been pursuing a strategy of asset diversification, such as renting out unused buildings, to increase his credit rating and finance the growth of the business.

Today, PX Farms offers a wide range of services, from construction work, in particular the construction of storage facilities, to the rental of buildings, agricultural services, logistics and transport.

With the weather clearing up, the Joker 12 CC, the Joker 12 RT and the Sprinter CO could be shown in the field.

Agricultural activities currently account for 57 % of the turnover. With 15,000 tonnes, milling wheat is the most important crop. He produces barley (8,000 tonnes), oats (1,800 tonnes) and peas (1,500 tonnes) as well as straw which he sells to an electricity plant. PX Farms is also the largest mustard producer in England. This year, the overall yield level decreased by 30 %. The farm works with 12-metre-wide machines (two Terrano, one Joker, six seed drills) based on Control Traffic Farming. All his employees receive board and lodging in Cambridge from July to October as well as bonus payments.

Moreover, James Peck relies on digital communication to increase his visibility in public and improve the image of agriculture. In less than a year, his YouTube channel already has 17,000 followers.

James Peck recalled the damaging effects of the Brexit on the procurement of parts and machines from Europe, but also the decline of state subsidies.

AGROVATION: RETHINK, SIMPLIFY AND RATIONALISE METHODS

In his presentation, Constantin Horsch spoke about the daily challenges and the changes that were implemented on the family farm AgroVation in the Czech Republic – based on the contract with his father Michael. Together with his brother Lucas, he took over responsibility for the farm purchased in 2012 and decided to further develop the classic farm structure (farm with one manager for the arable farming part) into a profitable and no-till orientated cereal farm. The objective behind this: manage a farm and familiarise himself with the realities on site before taking on further responsibility within the HORSCH Group. Since 2017, the two brothers have therefore been changing the farm structure and the management style. They opted for a horizontal organisation, reorganised the management structure and at the same time introduced an internal communication system with a focus on the independence and the sense of responsibility of the employees. This example of transferring the farm within the Horsch family is a counterexample to the trend described by François Purseigle. Even though Cornelia Horsch admitted that "it's not easy to work with the family every day", an important aspect is the delegation of tasks and the trust placed in the employees with regard to the tasks that have be carried out. Similar to James Peck, Constantin Horsch has also introduced a bonus system for the employees (e.g. linked to the care with which they handle the machines).

OPTIMISM: THE KEY IN VIEW OF A CONSTANTLY CHANGING WORLD

Philosopher Laura Lange made the audience think about the challenges of change and transition. Those who live in a constantly changing world have to see the meaning of their work, but above all maintain a constant optimism to master their everyday professional life. This fits in well with HORSCH's new claim "WE WILL FIND A WAY.": an invitation to take a step back, break new ground, overcome difficulties and move forward with confidence.

Constantin Horsch (right) explained the decisions and organisational changes that have been implemented on the AgroVation family farm. He has been running the farm together with his brother Lucas since 2017.

WET AUTUMN – BAD HARVEST?

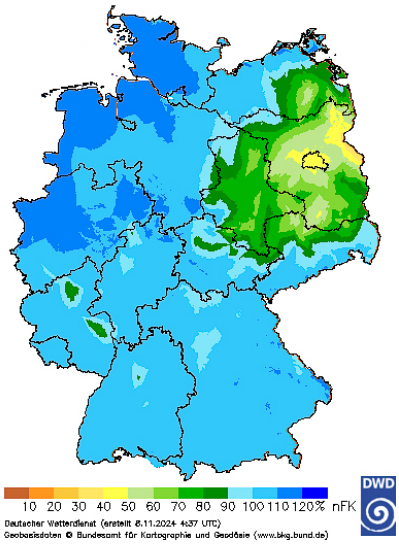
"Never since measurements began in 1881 has there been such a high level of precipitation in Germany for twelve consecutive months." This was reported by the German Weather Service (DWD) – in June 2024, mind you! In late autumn 2024, many farm managers were able to confirm that this weather situation has not changed fundamentally.

External surveys confirm that almost half of this year's winter cereal population was sown late. However, even timely seeding is often heavily influenced by wet conditions.

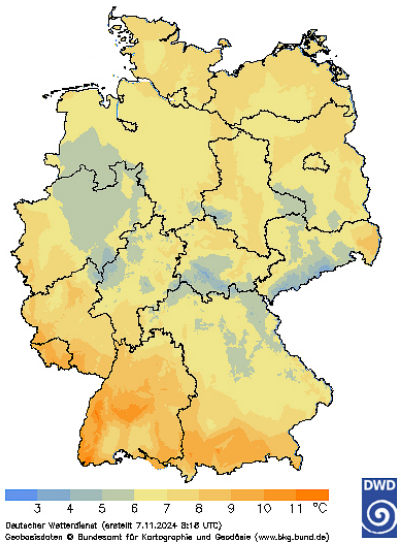
The soil moisture levels in the upper soil layers published by the German Weather Service show fully saturated soils at the beginning of November – with the exception of north-eastern Germany. The water in the soil also significantly determines our soil temperatures. While warm rain from the west in early spring can make the soil warm up more quickly, saturated soil in autumn leads to a lower proportion of air in the soil and thus to slower cooling.

More mass in the soil behaves more sluggishly because of the temperature fluctuations during the course of the day. Consequently, the plants actually should grow better if temperatures are more even. We can see why this is not always the case if we take a closer look at the necessity for oxygen in the soil. Bacteria and soil life in general need oxygen. Without oxygen, the soil falls into a reducing state and reduces the release and conversion of nutrients. The formation of fine roots depends on the oxygen content in the soil. Without oxygen, roots are reduced or rot. Excess CO_2 from root respiration cannot escape and also leads to damage. This hypoxia finally has a lasting effect on the entire hormone balance of the plant and changes its aim in life from "generate yield" to "somehow survive".

As more mass in the soil can lead to slower warming in spring, as the root system will be less well developed and as infiltration and drying will be slower, a number of challenges will be waiting for us at the start of vegetation. Nutrients that have to be mineralised (nitrogen, sulphur...) enter the vegetation cycle at a later stage and cannot be absorbed with maximum efficiency (phosphorus...).



Soil moisture (grass, loamy silt, 0–60 cm) – 07.11.2024



Soil temperature average 5 cm, sandy loam – 06.11.2024

Influence of tillage in autumn

To decide whether and how we can mitigate the situation with modified measures, we will first look at the role of tillage and take up the article in the last issue of terraHORSCH (Nostalgia or necessity?).

To be able to expect early mineralisation and even nutrient release, we first have to make sure that the starting materials degrade. "You can only take something out of the fridge if something has been put in first."

Straw and other organic matter need air (oxygen), heat and moisture for microbial degradation (there are also other degradation mechanisms, but these are of less use to us, e.g. UV weathering). The deeper we dig into the cultivated soil, the fewer coarse pores we find, and the less oxygen can initiate the rotting process. Sandy soil usually still has sufficient oxygen in deeper layers due to the coarser particles whereas in clayey soils the ratio of coarse pores quickly decreases in favour of fine pores. As shown in the following illustration, material to be decomposed should be mixed in evenly but not too deeply depending on the soil type. In case of high water saturation, these zones move upwards as the oxygen in the coarse pores is displaced by the water.

Coarse pores are important for the infiltration capacity of soils. However,

Incorporation – conversion degree to humus

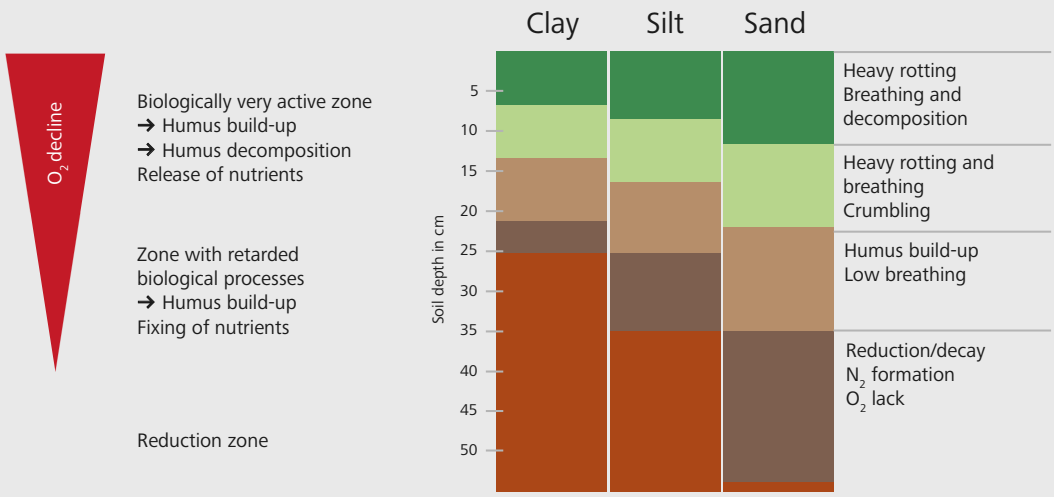


Illustration according to Prof. Dr. Dr. B. Bauer, 2020

this general statement is not sufficient for higher amounts of precipitation. The continuity of the coarse pores is important when it comes to leading large quantities of precipitation water into deeper layers. If coarse pores are missing, e.g. at the cultivation horizon caused by smearing cultivation, this becomes a bottleneck. Water accumulates in the area above and you cannot drive on the fields for a long time. This is most noticeable when there is too much rain between ploughing in slightly too wet conditions and seeding. The excessive number of coarse pores in the top 20 to 30 cm quickly become saturated and do not transport the water fast enough to deeper layers.

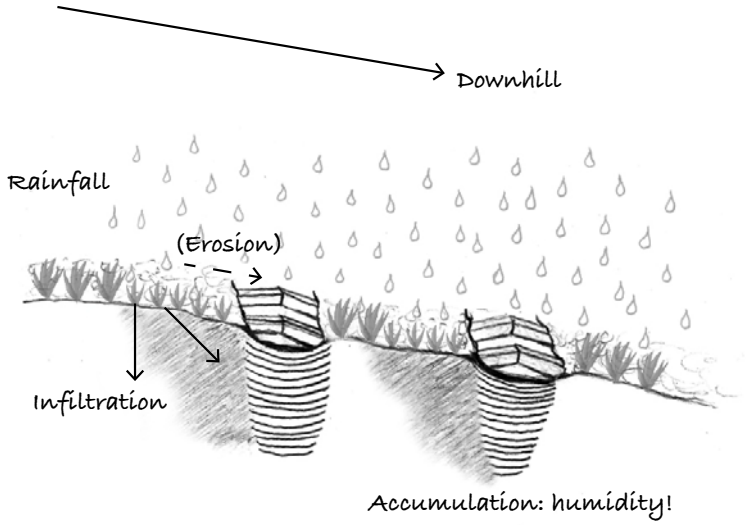
Water does not rise again in coarse pores during dry periods. In this case, the capillary power is too low. Only with sufficient consolidation and correspondingly small pore spacings, the capillary power is high enough that water and the minerals dissolved in it (free Ca^{2+}, potassium etc.) can be expected to rise.

The role of tracks

One point that is given too little attention is the influence of tracks on infiltration. Outside the tracks, water does not only flow vertically downwards into the soil. Even if ususally no erosion of precipitation water is visible on the surface, it flows towards the lowest point even if the slope is minimal. Water that is not retained in the soil accumulates either at the lowest point or in ponding layers. Tracks compact the soil below and prevent the water from flowing away quickly and horizontally. Water accumulates in the topsoil at the surface of the compacted track and drains off downwards more slowly. After large amounts of rainfall, it can be observed that the track does not only not produce any yield, but the plants in the neighbouring area also develop worse. The heavier the axle load and the lower the load-bearing capacity of the track, the deeper is the compaction and the larger is the negatively affected area.

In our latitudes, we cannot rely on a sufficient frost as a natural regeneration mechanism. We therefore have to reckon with a poor soil structure until at least the next tillage pass.

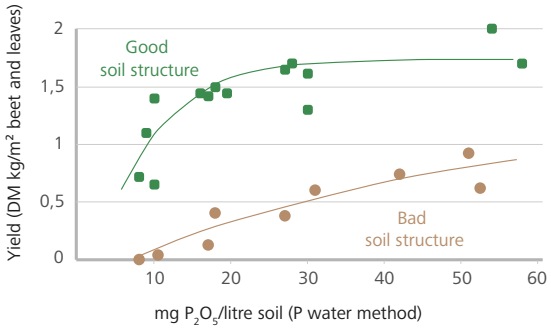
Poor soil structure does not mean that our imaginary fridge suddenly becomes empty, but that we can no longer access all the compartments in it. However, in contrast, plants cannot steal secretly from other compartments. Fertiliser has to be applied as needed resp. the few compartments have to be kept as full as possible. Needs-based fertilisation means to identify the incorrect information we receive from the soil analysis, if need be by means of plant analyses. At best, the soil analysis gives us the contents of the entire refrigerator.



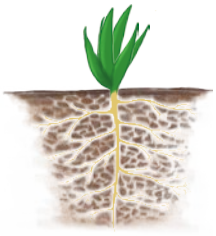
What pore distribution do roots want?

This question can be answered in a very complex way. Or you can look at the basic principle and derive the rest from it: Roots do not want intense soil density changes! Cavities are avoided just as much as smear layers. Smaller compaction zones are opened up over time. Roots also tolerate the jump from loose topsoil to firmer subsoil rather well as long as the transition is even. Interlocking the cultivation horizons with appropriate points helps in this respect. Free-flowing soil can be cultivated with wider points and a tighter tine spacing than coarsely breaking, very clayey soil. Cavities caused by dry and deep cultiva-

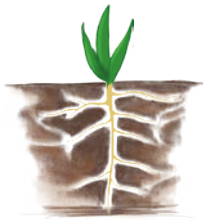
Soil structure and nutrient availability



Source: TLL, Jena



GOOD soil structure



BAD soil structure

tion can only be reduced, especially in deeper layers, by using the appropriate packer for the site.

Finally, we look at how our crops should ideally enter the upcoming dormancy period. It begins in Advent when the soil temperature consistently drops below 5 °C. The cell division of the crop plant starts to become very slow, and ryegrass and foxtail rarely germinate below this temperature. A real vegetation dormancy that lasts for weeks diminishes in our latitude and leads to only minimal growth breaks in crops with lower temperature requirements (rapeseed). Nevertheless, the right crop stage has to reached in the event of regular frost nights.

Rapeseed plants should be developed until the 10- to 12-leaf stage and form a good root structure. Moreover, the aim should be to achieve a deep taproot with a root diameter of 0.8 to 1 cm.

For wheat, too, the development stage of the plants is decisive for resistance. Wheat populations are very frost-hardy shortly before or shortly after the 3-leaf stage (conversion grain to root nutrition), and this stage is the best to enter the winter. This also applies to tillered plants. With their nutrient reserves, their regeneration capacity is very good. In principle, the aim should be tillering before winter as the shoots that are formed in autumn usually are somewhat higher yielding and more resistant than the shoots that are formed late in spring.

Due to the earlier stem extension phase, achieving a certain minimum target population density is even more important and yield-relevant for barley than for wheat. Here, too, the shoots formed in autumn achieve a higher yield. Therefore, the objective should be a good pre-winter development with tillering up to a maximum of EC 25. In this case too, overgrowth of the population leads to increased winter damage and higher disease infestation. In principle, winter damage can be prevented if the plants are healthy.

After a sufficient hardening phase, rapeseed and winter wheat can withstand temperatures of -15 to -20 °C and winter barley temperatures of -12 to -15 °C, even without snow cover.

If time is short for the timely establishment of the crop, the term ‘seedbed before seeding time’ applies until the point in time when sowing the crop really does no longer make sense. If there are no alternatives, one consequence may be to sow crops without prior primary soil cultivation, even if a previous tillage has been established on the site for many years. In the long run, a crop sown under less than optimal conditions is better than the wrong tillage. Seed drills without pre-cultivation tools that still achieve an optimum depth placement are predestined for this.

If cultivation has been carried out in wet conditions, it is important to keep an eye on the fields and, if necessary, to carry out repair measures in the coming years as well as to bear in mind the sluggish nutrient flows and the poor root system when carrying out population management measures in spring.

The HORSCH Avatar is ideal after intensive pre-tillage, but also for direct seeding.

HORSCH

#FUTUREGROUND

NEW LEVELS OF ALL-DAY COMFORT: **NEW LEEB PT & VT**

Quieter, more spacious and ergonomically designed, the all-new cabin takes the latest HORSCH self-propelled sprayers to new levels of all-day comfort and productivity. The state-of-the-art cabin features an advanced A-column terminal as standard and new control systems to create a comfortable, intuitive and highly productive workspace. **HORSCH.COM**

— Leeb-designed armrest and joystick specific for crop care applications
— Category IV filtration as standard
— Pneumatic 4-point cabin suspension available as an option

TOGETHER FOR A HEALTHY AGRICULTURE.

▶ Scan code for more information

HORSCH

#FUTUREGROUND

SHALLOW TILLAGE IN PERFECTION: **CRUISER 7 - 9 XL**

The **HORSCH Cruiser XL** is the specialist for shallow tillage and stubble cultivation. When cultivating stubbles in hard conditions, it benefits from the advantages of its tine and the various point options. **HORSCH.COM**

— Shallow stubble cultivation at a depth of max. 15 cm
— Seedbed preparation for following crops or for sowing catch crops in combination with a MiniDrill
— Keeps the field black after tillage
— Fights volunteer crops and weeds
— Levels the field before sowing

TOGETHER FOR A HEALTHY AGRICULTURE.

▶ Scan code for more information