### MECHANICAL WEED CONTROL ALTERNATIVES IN CROP PROTECTION



### Dear readers,

All around us we see that agriculture is in a process of radical change. Acceptance of chemical agents is decreasing, there *is growing resistance against currently* available substances, and hardly any new substances are coming onto the market. Also, legal requirements are becoming more and more stringent, and we therefore need effective alternatives. But while we won't be able to do without crop care in the long term, especially in the control of pests and fungal diseases, we need to develop alternative processes. Herbicides offer the greatest potential in this regard. Where entire gangs of farm labourers once set out to the fields with their manual hoes, this work is now being done by modern hoeing technology, increasingly also on conventionally operating farms.

It is therefore only apt that we dedicate the current issue of LEMKEN live to this topic. The acquisition of the Dutch company Machinefabriek Steketee B.V. has been an important step towards complementing the LEMKEN product range in a forward-looking manner by adding mechanical weed control implements and innovative camera technology fully in line with the LEMKEN crop care philosophy.

Naturally, we also have other interesting company and product developments to report on. We have high expectations regarding our new cultivator with particular strengths in stubble cultivation and weed control without the use of glyphosate, which will be available for the 2020 season.

Plus this issue of LEMKEN live again features reports on innovative farm managers from France, Italy, Germany and overseas, who share interesting insights into the diversity of European and international agriculture with us. Evidently, these businesses work with LEMKEN technology.

As you see, this issue of LEMKEN live is well worth a browse. We hope you will enjoy this read.

Yours N. Cerriter

Yours FAmile Anthony van der Lev

Associate

Managing Director

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### Legal information

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Steketee

Anthony van der Ley and Iljan Schouten, Head of LEMKEN's Crop Care business unit, are responsible for Steketee's operative management.

Mechanical weed control is currently attracting major interest. Approvals of active agents are subject to more and more stringent regulation, some agents have been taken off the market altogether, and the general acceptance of chemical crop care is dwindling. LEMKEN was early to recognise this trend. The acquisition of the Dutch hoeing technology specialist Steketee has been a logical consequence entirely in line with the LEMKEN crop care philosophy.

If there was a dating portal for agricultural technology, LEMKEN and Steketee would have been a perfect match. The two companies' profiles simply complement each other exceedingly well. "We supply implements which have gained a lot of recognition by professionals", says Klaas Veermann, the former owner of the Dutch company based in Stad aan't Haringvliet. "But then we were confronted with the question about how to go on." Should they invest to broaden their reach, or should



### **SOUGHT** AND FOUND

they look for a strong partner? Veermann didn't take this decision easy, as he is very passionate about Steketee. "We had something to offer, and our innovative expertise, for example in camera-based plant recognition, made us attractive above all." But he steadfastly resisted approaches by other companies that he wasn't happy with.

At the same time, LEMKEN worked intensively on expanding its position as a crop care partner for farming businesses, and the Dutch company with its bright red hoeing machines attracted LEMKEN's attention. The LEMKEN management saw that "Steketee hoeing technology would allow us to close a gap and take us a lot closer towards our goal. Also, our corporate cultures were a perfect match." Both LEMKEN and Steketee are family businesses with medium-sized structures, a direct contact to farming practice and an established presence on international markets."

### Machines by and for individualists

The acquisition was made official on 28/29 August 2018, and LEMKEN took over Steketee. The company's name will be retained, as will its signature red colour. Today, Anthony van der Ley and Iljan Schouten, Head of LEMKEN's Crop Care business unit, are responsible for Steketee's operative management. "The cooperation between LEMKEN and Steketee sets us up well for the future", comments van der Ley. "Hoeing technology will become more and more important, not only for organic farming. Alternative farming solutions, ranging from ploughs through to harrows, are more in demand than ever, also from farmers with conventional businesses. We have already seen significant increases in sales. LEMKEN's powerful network will take this technology to the farms. I'm certain that this trend will only increase, and for me this is a dream come true."

### Support from Alpen

Lara-Antonia Weiler has supported the executive since November 2018. She is a truly homegrown LEMKEN talent, having researched her master's thesis on product management in electronics with the company and then having stayed on. She assists Steketee's integration into LEMKEN's corporate structure. "I've been detached to the Steketee headquarters for a period of two years so that I can be there to support communications between the two companies and help build up marketing", Weiler explains. She communicates the benefits of hoeing and camera technology to potential customers through expert contributions.

But it's actually not that easy to describe the machines, she says. There are hardly two machines the same: "The implements are configured just as individually as customers' operating conditions are", she elaborates. "That's what we internally refer to as a modular system." Of course, this requires very detailed consultation. And that - as well as customised configuration and the entire production process – is what the company has a highly qualified team of 60 employees for at its Stad aan't Haringvliet headquarters, including an in-house development team.

#### Smart hoeing technology

Steketee's innovative solutions for hoeing and camera technology continue to be developed at the company's production facilities in the Netherlands. The machines manufactured there are customised in keeping with customers' application needs and preferences. Fundamentally, there's a choice between front- and rear-mounted hoes, and customers next select one of the three available parallelogram elements:

- The Basic element is particularly well suited for light conditions and low crops in tightly spaced rows, for example in vegetable production. It allows for a minimum row distance of 15 cm and an underframe clearance of 50 cm.
- The heavier Combi element offers not only a hydraulic lift but also enables operators to apply pressure to their implements. The Combi element was developed for medium to heavy conditions with a minimum row distance of 20 cm and an underframe clearance of 70 cm.
- The TRS element is ideal for very heavy conditions, minimum row distances of 20 cm and an underframe clearance of 70 cm.

Furthermore customers have a detailed choice between a wide range of tools, including duck-foot shares, for example. These can move both forward and backward and from side to side. Shares, whether A-shaped or L-shaped, in a rigid mount are the most precise option for evenly shallow tillage. Given optimal conditions and highly precise longitudinal seed placement, the distance between rows of crops can be as narrow as 6 cm with L-shares.

Tools such as protective panels, finger hoes, brushes, torsion weeders and plates for ridge tillage round off the range to allow for intra-row tillage, among others. All versions are available with fully or partially manual controls or with camera control.



- into LEMKEN's corporate structure and looks after building the company's marketing.
- aan`t Haringvliet (Netherlands).
- needs.
- rows.





#### A camera at the heart

The optional Steketee IC-Light control system makes it easy, economical and effective to control different machines in row crops. Row sprayers, hoeing machines etc. can be guided highly accurately, at a precision level of just a few centimetres and speeds of 3-15 km/h. The IC-Light camera automatically detects crop rows and steers the machine between rows independently of the tractor. It is capable of identifying rows of crops not only in the green colour range but also in the RGB spectrum (with RGB standing for red, green and blue). These primary colours can be used to represent virtually any shades of colour, about 16 million mixed hues. This is essential if red leaf lettuces or yellowed nitrogen-deficient crops are to be recognised, for example, so that precise row guidance can still be ensured. The system additionally features an auto-learning function, which prevents colour differences from affecting the precision of the camera guidance system. The IC-Light detects 1 to 5 rows and is guided by the longitudinal row orientation. Gaps between plants usually have hardly any effect on row control. In optimal conditions, the camera easily corrects row control at ground speeds of up to 15 km/h. A major benefit is that the camera is designed for flexible handling. It is also available separately with a parallelogram frame and without a hoeing bar. The camera is furthermore very easy to mount to another hoeing bar with different row spacing.

The IC-Weeder is more sophisticated again. This implement, which is available up to 6 m wide, recognises individual plants and is even capable of hoeing between plants in a row via pneumatically controlled tools. The work section is fully encased in a housing to ensure even lighting conditions. The implement can run at speeds of up to 3 km/h, depending on plant spacing: the tighter they are planted, the slower. The IC-Weeder is mainly used in vegetable production.

### Possible combination with chemical crop care

For conventional agricultural businesses wishing to reduce their use of crop care products, Steketee offers various band application options that can even be deployed during the hoeing process. There is not only standard row spraying, but also under-leaf and tunnel spraying for protecting crops. With IC-Spray, Steketee developed a spot spraying function for the IC-Weeder. The position of crop plants is calculated accurately from the images provided by the camera, combined with data on planting and row distances. This data can then be used for both actively guiding the blades of the IC-Weeder via a pneumatic system and for controlling a spot sprayer application.

Steketee is one of the industry's pioneers in camera technology. As early as in 2000, the company won the Wageningen Innovation Award for its use of a camera for automatic machine control, and it has actively researched and developed camera technology internally in cooperation with Wageningen University since 2007.

What a machine ultimately looks like when it leaves the factory floor depends solely on the customer. Steketee hoeing technology is definitely a forward-looking complement to the LEMKEN product range to support farmers all the way through from stubble cultivation to the harvest. Report from France



Christophe Steiner, LEMKEN Area Sales Manager France, (left) talking with farmer Adrien Pelletier. For both, Steketee technology is somewhat breaking new ground.

# **FARMHOUSE BREAD** FROM THE FARMER'S HAND

Ferme d`Orvilliers is the name of a farm in the French region of Centre-Val de Loire. It is run by two enthusiastic brothers and their innovative parents, who together manage a business 360 hectares in size. When the family tells their story, it is evident that bread, organic farming, direct marketing and, most recently, the Steketee brand have all played a major role.

The farm manager, 35-year-old Adrien Pelletier, is particularly committed to not only cultivating agricultural products such as cereals, but also to growing and selling fresh produce as an end product instead of supplying it to anonymous buyers. Good that his brother Benjamin was happy to support his idea, and good that their father was happy to set aside 50 hectares of arable land for the purpose. This is where the Pelletier brothers are now farming organic cereals, which they mill to make flour and bake their own organic bread. This is then sold in the farm shop and on farmers' markets. The bread business has already grown to employ five people, including a qualified baker.

Pelletier, who studied agronomics, additionally helps manage the family farm, most of which (220 hectares) is farmed organically. The rest is cultivated conventionally. "For our conventionally managed land, we are looking at no-till

Adrien Pelletier is not only an agronomics engineer and organic farmer. His passion is breadmaking, and he has ever written a book on the subject. LE CUIDE PRATIQUE



farming", Adrien Pelletier explains, "which is still a largely untested approach in our region."

### Innovative cycles

The farm does not have any livestock. "We get organic fertiliser from our neighbouring farms", Pelletier says. Poultry manure, which has a rapid effect, is particularly well suited, and fellow farmers' grazing cows supply the business with organic slurry right to their doorstep. Alfalfa, which is indispensable for most organic farms, is not used as forage, as the Pelletiers don't keep cattle, but instead to propagate alfalfa seeds. Wheat, spelt, potatoes, sugar beets and green beans are also used in crop rotation.

The combination of alfalfa and rye is a somewhat unusual feature of this farm. Once alfalfa seeds have been harvested, Pelletier sows rye on the fields and then mulches the volunteer regrowth in the subsequent spring. "We use the mulch to cover our potato ridges", he explains. "That's not only an excellent way to keep weeds under control, but also supports effective water management and combats powdery mildew in potatoes." At the

Ferme d'Orvilliers, crops are therefore not only for harvesting, but always support other cultures as well

#### Hoeing against weeds

Mechanical weed control is essential for the organically farmed areas. Thistles, docks and sorrels (rumex) are a particular problem for the farm. Pelletier applies a three-stage approach to keep them under control. In a first pass, he works with a hoeing machine with rotating shares, followed by a second pass with a harrow. To round this off, he finally uses a Steketee hoe with four metres working width and camera-supported automatic machine control, combined with GPS and automatic steering support. "The precision you get when using the camera is simply unsurpassed", Pelletier enthuses. As the camera system is mobile and can therefore be mounted to different hoeing bars, it is highly flexible – yet another factor he appreciates very much.

Another advantage of the Steketee hoeing machine is that the three-point headstock is available separately for different row spacings. This makes it very easy to adapt it to the various row spacings Pel-

letier uses in his crops, from 25 cm for cereals to 50 cm for sugar beets.

#### Red is the new blue

France is one of the most important markets for Steketee hoeing machines, which are now being distributed by LEMKEN, following the Dutch manufacturer's acquisition last year. LEMKEN has left both the brand name and the signature bright red of its machines unchanged.

Mechanical weed control is based on weeds being uprooted, cut off and buried. Steketee hoes are available with a wide range of different tools and shares, depending on the intended use, for example L blades, duck-foot shares, hoeing blades, spring tines with duck-foot shares, torsion weeders, finger hoes and rotary harrows.

"Our soils constitute a particular challenge for the tools", as Pelletier has learned from experience. "We have enormous wear, but we worked together with our local agricultural machinery dealer to solve the problem by reinforcing the shares with carbide plates. With this addition, the machine did its job with flying colours this year."

### A farmer and baker

Well-structured processes in the fields and reliable machinery create scope for new initiatives. Adrien Pelletier used this new freedom to write a book. "Paysans Boulangers" is the French title of his practical guide for all who would like to bake their own bread or want to find out what makes a good organic bread.



# **FARMING 4.0:** START-UP SUPPORT FOR AGRICULTURE

since 2017. Based on the experiences gained, its start-up business supports farm managers as they step up to the future.

Wishful thinking or reality? agricultural engineer chose Maxau Estate, a farming business "For anything to do with future issues in arable farming, the only a few kilometres from the cooperative's headquarters in mainstream answer is most likely Farming 4.0", muses Jochen Karlsruhe. And what's even more important, he and farm man-Schneider. "But if I take a closer look at the solutions offered ager Dr. Andreas Schmid immediately got on. "I've long had an by providers, I tend to come to a sobering conclusion: Many of interest in sensor-supported section-specific management", them are not yet truly helpful or ready for field use in every busicomments Schmid. Maxau Estate has 193 hectares of farming ness." This insight motivated Schneider, one of the ZG Raiffeisen land with very variable soil quality, i.e. optimal conditions for cooperative's 1,900 employees, to investigate this area further. using technology, even though its land is distributed across "I wanted to know what is currently working and makes sense 135 fields. "That's not unusual for our cooperative's catchment in local conditions. And I wanted our customers to benefit from area, but it does constitute a special challenge", says Schneider, the insights gained." explaining why Maxau was a good choice.

Trial under real operating conditions He started the first trials on a total area of 36 hectares in the What they therefore needed was an agricultural business where autumn of 2017. The Augustenberg Agricultural Technology Schneider would be able to put his goals into practice. The Centre (LTZ), a facility of the Baden-Württemberg Ministry of

### ZG Raiffeisen Cooperative has tested technology and software for digitalising agriculture at Maxau Estate

This maize was sown with an Azurit DeltaRow. The triangular seeding pattern ensures an improved distribution of growing space within rows.

- ↑ Crops grown on fields with section-specific management develop more homogeneously.
  - ↑ Drone photos provide impressively clear evidence of differences in soil quality.

Agriculture, partnered with the cooperative in the trials. The Centre's employees are responsible for agricultural trials and consultancy, among others, and Dr. Martin Weis is in charge of digitalisation issues within the LTZ. He worked with Schneider to define the focus areas for the project, which will be supported as part of the digitalisation strategy of the federal state of Baden-Württemberg. The areas to be looked at are section-specific applications of nitrogen fertiliser in wheat, the use of plant growth regulators in cereals and crop care assistance systems for automatic compliance with distance requirements. The cooperative additionally studies the section-specific sowing of cereals and grain maize, precision seeding of cereals and different sowing methods for grain maize.

### Project partner LEMKEN

Schneider was able to recruit LEMKEN as another partner to support the project. "I was able to meet managing director Anthony van der Ley at the Agritechnica, and I explained our project to him. LEMKEN provides the technology for sowing (Azurit, Saphir) and crop care (Sirius with Gemini front tank), while the supplier Fritzmeier contributes the sensor for nitrogen fertilisation and growth regulator use. Both companies additionally support the project through their expertise.

#### A special surprise effect

"We were initially surprised about just how much information we were able to gather from drone and satellite images. The differences in soil quality, biomass and yields are larger than we had thought. Even if we walk through the crops and pay very close attention, we'll only see a fraction", Schneider explains. He believes that section-specific farming is the right way to go in both economic and environmental terms. Optimal distribution is more important than ever, given legal requirements regarding the quantities of fertiliser farmers may apply. In future, farm inputs will need to be used even more efficiently than previously. As far as seed use is concerned, the question was whether farmers should sow more or fewer grains per square metre in high-yield than on low-yield sections. "To work that out, we need seed drill technology that ensures reliable emergence. This is achieved with the Saphir and Azurit, where press wheels deliver excellent results", says Schneider.

#### The goal is plug & play

The project team has been testing a range of different sensor and software modules for section-specific management. But sometimes things don't work as intended at first go. One of the reasons for this is that very specific requirements apply to some of the trials. Weis explains: "Users want technology that

Dr. Andreas Schmid: "I've long had an interest in sensor-supported section-specific management."

ideally works according to the 'plug & play' principle." Unsurprisingly, farmers don't actually want to read lengthy operating instructions; they're after easy, intuitive interfaces. "That's exactly why user-friendly devices such as the iPhone have been so successful."

Schneider, Weis and Schmid are therefore very excited about the agrirouter, a data platform that will connect implements and devices by very different manufacturers, ensuring compatibility and making data transfers via USB stick a thing

of the past. According to them, the latest generation of ISOBUS implements is also a lot better than their predecessors.

Start-up support from a start-up

One of the project partners' main goals is not to keep these experiences to themselves but to share them with farmers. This is why the ZG Raiffeisen cooperative founded ZG Raiffeisen Landwirtschaft Digital 4.0 GmbH in 2017. This company, which focuses on Farming 4.0 and is run by Schneider as its managing director, gives farmers the opportunity to access





compatible digitalisation services of their choice without making major investments. Services range from calculating yield potentials for different locations to preparing application maps and evaluating and documenting results in a field database. However, farmers are encouraged not to place blind trust into digitalisation. "This is about bringing together new technology with existing expertise and experiences", emphasise Schneider and Weis.

The start-up also helps make contact with other companies able to complete relevant works with their machines. To date, demand for this innovative range of services has been slow, however. Schneider believes that this is due to many farm managers still being rather hesitant, as they are scared off by the time and effort needed to engage with this new, complex domain. Trichogramma application using a multicopter, yet another service offered by ZG Raiffeisen, has proven a highly positive development. The company currently spreads these minute wasps over 15,000 hectares of maize to combat European corn borers.

Schneider is convinced that this is the way to go: "We need Farming 4.0. After all, this is about efficient, competitive agriculture, which the entire industry needs to survive."

**Report from Italy** 

### Two labels – two qualities

**Dural for long service life DuraMaxx for outstanding hardness** 



### **LABELS OF DISTINCTION!**

LEMKEN now divides its range of wear parts for the implement groups of cultivators, ploughs, rotary harrows and compact disc harrows into two product lines, which are labelled accordingly.

major considerations when deciding on purchasing one implement or another. This isn't only true for the implement itself, but also, and above all, for wear parts. This is why LEMKEN has body shape, for example to prevent soil from sticking. As the always paid particular attention to different practical requirements when developing its spare parts lines. The development to offer both lines in parallel, with the Dural guality being genand production of high-guality wear parts has always been one erally supplied as standard equipment. of LEMKEN's core principles, and this is now being communicated consistently by introducing the two wear part lines of Dural However, LEMKEN extended its range of particularly wear-reand DuraMaxx.

Each line is labelled with its own logo. Dural stands for long service life The development of this line can be traced back to the 1980s, when LEMKEN launched the first generation of branded bodies made out of specially hardened steel were introduced on the market together with the Tansanit and Juwel series. These instantly extended the service life by up to 150%.

DuraMaxx delivered so many advantages that LEMKEN even Given the expanded range of particularly durable wear parts for considered only producing this quality, but the development took a different turn. Dural bodies still offered a perfectly adequate service life in soils that didn't cause that much wear. This

Local conditions and the desired acreage performance are was evident on the extensive farms in Russia and Ukraine, for example, which mainly have low-wear chernozemic soils. For these businesses, it is particularly important to select the right purchase costs for the Dural line are lower, LEMKEN continues

sistant parts, which from last year now include stubble cultivation implements. Needs have also developed in this field. For the Karat cultivator, there is now a full range of carbide-coated parts, for example, in addition to steel and hard-faced shares. For the Rubin 10 compact disc harrow, customers have a choice wear parts with its Dural plough bodies. Later on, DuraMaxx between discs with various hardnesses. From this autumn, the three options currently offered for the Karat cultivator, i.e. hardened, hard-faced and carbide-coated, will also be available for the Zirkon 12 rotary harrows.

> many tillage implements, LEMKEN decided to market the new wear part lines consistently under their own Dural and Dura-Maxx brand names.





# **ABOUT RICE AND RISOTTO IN ITALY**

Most non-Italians associate the cultivation of rice with south-east Asia. But it has also been grown in this Mediterranean country for 500 years, mainly in northern Italy, west of Milan.

A long-standing tradition "In Italy, rice has a

long tradition. Its first official mention dates

back to the year 1468", states Marco Romani emphatically. Romani, who works for the Ente Nazionale Risi (ENR) rice research Largest producer in the EU centre, smiles as he notes my surprise. Naturally, for most peo-The cultivation of this water-loving cereal is particularly wideple the mention of rice cultivation conjures up images of rice spread in the northern Italian regions of Piedmont and Lombarterraces and farmers ploughing their flooded fields with water dy. The triangle marked by the cities of Novara, Vercelli and Pavia buffaloes. At the same time, most people know that risotto is an contains about 93% of the Italian rice production. The total area Italian national dish. And risotto turns out best with rice varietunder cultivation for rice was about 217,000 hectares in 2019. ies traditionally grown in Italy. Italy is the EU's largest rice producer, with a 53% share in the

### **Ente Nazionale Risi:**

- Founded in 1931, 27 employees
- Funded by rice trading ( $\in$  3.40 per tonne)
- Tasked with promoting rice "made in Italy", providing technical support to improve production, monitoring trade activities, gathering statistics, representing interests at the European Union level, providing advice and conducting field trials

### **Risotto al dente**

Risotto in fact needs quite a particular type of rice. "These varieties have a very high content of amylose. This starch ensures that the rice absorbs a lot of cooking liquid and becomes creamy while still retaining a bit of bite", explains Filip Haxhari, one of Marco's colleagues. But the variety alone does not ensure success. Cooks need a fine sense for the cooking time. As far as ingredients are concerned, the motto is: use what you like.

**Report from Italy** 

← Filip Haxhari: "Varieties such as arborio, vialone and carnaroli are ideal for risotto dishes." The agronomist knows what he is talking about. Breeding new varieties is one of the focus areas of the rice research centre at Castello d'Agogna. It is only fitting that the centre manages a large seed bank. Its air-conditioned storage facility hold about 1,500 varieties of seeds grown worldwide since 1800. Breeders use this gene pool to fine-tune yields, resistance and quality properties. Filip Haxhari explains:

"Over time, seeds lose their ability to germinate, which is why they are sown every 10 years, and a small portion of the harvest is put back into the seed hank.

∠ Marco Romani (left) and Filip Haxhari inspecting rice plants in the greenhouse

### total area. Average production in recent years was 1.5 million tonnes. By way of comparison, China produced 212.7 million tonnes in 2017 (FAO 2017). Over a third of Italian-grown rice (37%) is for domestic consumption, while 53% is exported to EU countries and 10% to non-EU countries (ENR).

### Rice needs a lot of water

The region west of Milan meets two basic requirements for growing rice: It has absolutely flat terrain and enough water from the nearby Alps, which is guided to each rice field via an intricate system of canals. "Rice needs a lot of water, about 32,000 m<sup>3</sup> for a hectare yield of seven tonnes", Romani explains. Italian-grown maize,

in contrast, only needs about 20% of this amount of water per hectare.

The agronomist has already noted early effects of climate change: "Higher temperatures and less snow in the Alps mean that snow melts earlier. Dams and reservoirs are empty by late spring, but that's precisely

when we need lots of water." Rice farmers are able to use the water as long as it's there. However, even if they pay a fixed water price of €225 per hectare, they need to manage this precious resource carefully.

### Dry rice - cultivation throughout the year

October:	Stubble cultivation with the Rubin
November-January:	Maintenance and repair of canals
February:	Seedbed preparation with the He
March–April:	Glyphosate use against emerging
April:	2nd half of the month: sowing rice
May:	Herbicide application
June:	First fertilisation with NPK fertilise (about 10 cm deep). Water is drain
July:	Fungicide application (once), mai July with NK fertiliser (approx. 35
August:	Water is drained
September:	Combine harvesting, harvest star (1 t crop yields 0.6 t rice for sale) a

#### A systemic question: wet rice or dry rice cultivation

Wet rice cultivation has a long tradition in Lombardy. With this approach, farmers flood their fields before sowing them in May and methane production, which is only about a third. Methane is using fertiliser spreaders. The water is only drained a few weeks particularly damaging for the environment because it accelerates the greenhouse effect 21 times as much as carbon dioxide. before the harvest. Romani estimates that 80% of the rice fields in the area are under wet cultivation. The remaining 20% are cultivated under the dry approach, with increasing tendency. With Twelve employees of the ENR research centre provide rice this method, farmers sow the grain in dry soil, and the fields are farmers with advice on whether dry rice or wet rice cultivation only flooded in about mid-June. The ENR agronomists are comis more financially and environmentally sustainable, as well as paring and developing both systems on part of their experimenon issues such as tillage, variety selection, crop care, fertilisation tal fields, which extend across a total of 60 hectares. The yield and precision farming. All this to improve profitability. This is from wet rice cultivation is a few percent higher than from dry urgently needed, as Romani's statistics show that yields in Italy cultivation. Permanent water cover suppresses weeds, while the have grown 16–18% over the past 30 or 40 years, whereas many rice continues to grow, as rice plants have so-called aerenchyma other rice-growing countries achieved 100% increases over the same period.



9 compact disc harrow (once or twice) pumps and dams odor compact disc harrow (once or twice)

weeds and wild rice

with the Solitair 9 seed drill at a rate of 30–250 kg/ha

(approx. 66 kg nitrogen/ha), then field flooding ed temporarily before fertilisation or crop care activities. nly against leaf smut; second fertilisation at heading time in late (g nitrogen/ha)

ts at a grain moisture below 22%, cleaning d drying to 13% moisture

> tissue to supply the roots with oxygen. Dry rice has clear benefits in terms of water consumption, which is about 10 to 15% lower,

Wet rice (left) and dry rice cultivation on the ENR trial fields in May.



#### The Premoli family businesses

Giovanni Premoli is one of Italy's about 4,000 rice growers. He lives in Certosa di Pavia, 25 km south of the large city of Milan. Giovanni, his wife Maria Grazia and their son Nicola are farming about 120 hectares of rice. The Premoli family works on their fields in summer, preferably between 8 am and 7 pm, as mosquitoes become unbearable between 4 and 8 am and 7 and 9 pm. Rice paddies are an ideal environment for mosquitoes.

> Premoli's father worked the same fields with 21 employees, and his grandfather had a lot more again. Until the 1960s, when mechanisation gradually started, rice was cultivated only manually by female migrant workers called mondine.

The Premoli family cultivates their rice dry. The main argument is more efficient weed management compared to wet rice cultivation. The greatest crop care challenge is how to control wild rice. The Premolis use the following strategy: They prepare the seedbed as early as in February with their Heliodor compact disc harrow. This gives them time to apply glyphosate once or twice to control emerging weeds before they sow rice in April. They use a Solitair seed drill to sow the rice evenly and shallowly so that it germinates and establishes itself quickly. "With its sharp-angled double disc coulters and gauge wheel, the Solitair is excellent for this", says the rice farmer. Once the mulch seeds have emerged, he is able to control wild rice by mechanical means. Any remaining wild rice plants need to be removed manually later on. Each wild rice plant produces about 130 seeds, which will emerge again in the following year.

### LEMKEN machines for mulch tillage

Premoli only uses LEMKEN technology for tillage and sowing. The decisive reason for doing so was when he switched to mulch tillage in 2005. At the time, he looked for suitable technology for man-



aging rice straw, which is tougher than wheat straw, for example. His first purchase was a Rubin 9 compact disc harrow. Its disc size, ground clearance and mixing effect were all perfect for this technophile farmer. Gradually, he then replaced more and more machines with LEMKEN implements. "I invested in quality and use the excellent service provided by my dealer Agrinovac, only a few kilometres away", Premoli explains.

### Rice – his favourite crop

Premoli's favourite crop is rice, as it is most profitable on average over time. He harvests about six tonnes of carnaroli risotto rice per hectare. However, widely fluctuating rice prices make this crop a bit of a game of roulette. Over the past three years, prices have varied between €420 and €900 per tonne. Another imponderability is the weather around the time rice flowers in August. This tropical crop does not like cool nights at all and responds to them by severely reduced yields. That's why Premoli has no

plans to expand the cultivation of rice on his fields. Instead, he has diversified the range of crops he grows in recent years. He has started to farm grain maize, soybeans and winter barley organically on 50 hectares to buffer the risk of his rice crop. And he recently joined the regional RiceUp marketing initiative, hoping that it will secure more reliable revenue.

Given that rice is Premoli's favourite crop, it is only apt that risotto is also his favourite dish. He particularly loves it with salsiccia, a typically Italian type of sausage, beans and tomatoes. Of course, the dish is cooked to perfection by his wife Maria Grazia.

### Recipe for risotto a la Maria Grazia

Risotto with salsiccia, borlotti beans and passata Dice the shallot and sauté. Add the sausage, passata and borlotti beans. Stir in the rice and continue to sauté until translucent. Deglaze with a glass of white wine and toast gently. Gradually add the prepared beef stock and simmer for about 18 to 20 minutes. Season with Parmesan cheese and butter to serve.

Ingredients (serves 4): 150 g salsiccia, half a shallot, 75 g borlotti beans, 320 g carnaroli rice, approx. 1.5 | beef stock, 15 g butter, 2 tbsp Parmigiano Reggiano cheese



# **LEMKEN TURNS IDEAS INTO GEMS**

The goal set was to build a new cultivator with particular strengths in stubble cultivation and weed control without using glyphosate. Ludger Maas developed this implement together with a team of experts – in less than two years. A glimpse of his design office and the factory floor tells us how an idea was turned into the new Koralin.

"The decision to develop and build a new hybrid cultivator was taken in February 2018", LEMKEN mechanical engineer technician Ludger Maas remembers and adds the main reason for the project: "Given the ongoing debate about the approval of glyphosate and other herbicides in many countries, we wanted to be able to offer alternatives. Mechanical weed control will become more important again in the future."

The 52-year-old is responsible for the project of designing the Koralin, which is how the new implement has been named. Maas has already gained plenty of experience with similar projects, including the development of the Heliodor compact disc harrow. He lives and breathes agricultural machinery, which fascinated him even when he was a child: He loved to tinker and weld in the workshop on his parents' farm near Alpen. Completing an apprenticeship with LEMKEN was the only logical thing to do.

### Within schedule

"We set ourselves an ambitious schedule", Maas explains. "We" that is the project team consisting of experts from Development, Validation and Product Management. While Maas has responsibility for the project, he emphasises that he is only one cog in the wheel. "We'll launch the pilot model at the Agritechnica 2019, and we'll start supplying the implement in limited numbers from 2020." Only two years from an idea to the finished product - that was a challenge, but also an achievable one.

Developing a cultivator that delivers high acreage performance for stubble cultivation and seedbed preparation and has particular



### Koralin schedule:

Winter 2017/2018	Concrete deliberations
February 2018	Decision to develop a hybrid cultivator
From summer 2018	Testing and comparison of functional models Construction of the first prototype, practical trials on about 1,500 ha on farms around Alpen
August 2019	Completion of the pre-series model: endurance tests on a number of farms in various regions of Germany and France
November 2019	Launch of the pilot series at the Agritechnica
2020	Delivery of the first pilot series implements

strengths in weed control has been one of LEMKEN's goals for some time. Maas and his colleagues from Development and Product Management always have their ears to the (farming) ground by communicating with Sales. That's how they know what farmers want. In recent years, mechanical weed control has emerged as a hotly discussed topic at agricultural trade fairs. When the glyphosate issue exacerbated the situation, the time had come for the hybrid cultivator project.





ractice tests, CAD applications and tension measurements on implements produce important information for selecting materials and specifying material thicknesses.

An unpainted component for the new Koralin hybrid cultivator.



### Function first, technology second

Maas worked with an external engineering firm to develop two functional approaches to the task. These involved machines with working widths of three and seven metres, which were equipped with different tool arrangements. The trial machines were tested extensively. "We were working to develop an implement that only

### Range of applications (extract product specifications):

- Shallow stubble cultivation and seedbed preparation
- Mechanical weed control

### Tools:

- Shallow tools for cutting across the full width and light mixing
- Levelling tools and trailing rollers
- Optional four-row harrow

### **Possible applications:**

- Incorporation of catch crops
- Very shallow tillage up to 10 cm deep across the full width following cereals and oilseed rape for incorporating straw, causing volunteer cereals and rapeseed to germinate and breaking down soil capillaries
- Loose soil structure after cultivation; rhizomatous weeds deposited at the surface

has as much technology as is actually needed", Maas explains. Combining a disc and a tine section proved the most effective approach during the testing period. The basic implement comprises a tine section ahead of levelling tools. A disc section can be optionally added ahead of the tines to ensure disruption-free work even with heavier weed infestations. A chassis with tyres was found to deliver the most effective depth control. Many competitors use rollers for depth control, but these have a major disadvantage, as they push weeds back into the soil.

Once the fundamental functional principle had been agreed, it needed to be implemented technically. This task included selecting materials, for example, and specifying material thicknesses. CAD applications for calculating forces as well as tension measurements on the implements provide important input at this stage. This is the part Validation is responsible for. The first prototype was then built once the core specifications had been defined for technical implementation.

### Durability test under real operating conditions

Maas and the project team trialled the prototype with farmers around Alpen and optimised it based on their experiences. A pre-series model was then built, which was completed in mid-August 2019 and delivered to trial farms in Germany and other countries. Farms working in extreme conditions are particularly in demand for this purpose, i.e. those with dry or rocky soils or where managers put their machines through their paces beyond the usual limits. This produces a clear image of the implement's performance so that any remaining weaknesses can be identified and eliminated. These extensive preliminary works ultimately resulted in the production of the socalled pilot series, which will be showcased at the Agritechnica 2019 and supplied to customers in limited numbers as early as in 2020.

#### Standing out from the competition

All of this shows just how high the developers' expectations were regarding this new hybrid cultivator. "We do everything to ensure that we deliver a product that exemplifies the proven LEMKEN guality." Maas proudly points to the design drawings on his monitor. "This implement incorporates a lot of solutions that we worked on very intensively.' Among them is the symmetrical array of the disc and tine sections, which prevents side draft. Or the special disc position immediately ahead of the shares, which reduces share wear by up to 75%. The quick-change system for the shares, which was already implemented in the Karat, is another practical solution. Wherever required, a four-row harrow can additionally be installed instead of a roller, making weed control even more efficient.

Close cooperation between those in charge of development and the Validation, Product Management, Production and Sales departments as a team was decisive for this successful cultivator project. Maas is sure that the youngest LEMKEN "baby" will make its way: "There is currently no comparable machine on the market."









- Numerous practice tests were conducted to optimise the tools for cutting across the full width at a shallow depth, while also producing a gentle mixing action.
- The symmetrical arrangement of the disc and tine sections prevents side draft and saves fuel.

### MECHANICAL WEED CONTROL IN BEET FARMING – A FEASIBLE ALTERNATIVE?

Better hoeing machines, lower social acceptance of chemical crop care and higher demand for organically produced foods have put mechanical weed control back into the spotlight. Nordzucker AG, one of Europe's leading sugar manufacturers, provides extensive consultancy to growers.

### Awakening from a deep slumber

Farmers' interest in mechanical weed control has increased significantly in recent years. This has several reasons. Camera- or GPS-controlled implements take strain off operators and allow them to work very closely to rows of beets, to drive faster and achieve higher acreage performances. Another important aspect is social pressure, as the acceptance of chemical methods is decreasing. This has resulted in restrictive approval processes within the European Union, which will cause more active agents to be taken off the market.

#### Need to relearn

Most farmers set their mechanical hoes aside back in the 1970s and 1980s and learned how to control weeds efficiently by using different cocktails of herbicides. Now, 40 years later, going back to traditional methods means relearning past skills, as modern farms are run by a new generation of managers. The expertise of Franz Hesse and Thilo Hahnkemeyer, both with Nordzucker AG, is therefore much in demand.

> "We combined a hoe with a band sprayer in our trials and achieved savings of 50 to 60% of the herbicide quantities applied compared to broadcast spraying. However, it takes about three to four times as long if we do three passes, plus we need to consider the machine costs for the hoe", says Franz Hesse. Each farm manager therefore needs to decide for themselves whether it makes sense for

them to switch methods. The crop consultants' experience has shown that yields are the same, although hoed crops appear to be developing better, especially when capped areas are broken up. The effectiveness of weed control is comparable to that of broadcast spraying, provided that it is applied skilfully and conditions are good.

### The right environment is a must

For example, conditions must be dry after hoeing so that weeds dry out. Largely rock-free soils are an advantage, as are sharp implements with precise depth control. Given the right technology, herbicide bands can be made narrower, creating the potential for greater savings. What's important is that the crops are largely clean as the soil is covered. If this isn't the case, under-leaf spraying can be applied as an emergency measure, at least by conventional farms. This makes the process considerably more expensive, though.

#### Manual labour costs a lot of time and money

"Weed control is a sticking point in organic sugar beet farming", says Thilo Hahnkemeyer. Weeds in rows can only be removed with manual hoes because the technology is not yet mature enough. There are major differences between businesses, though. Hahnkemeyer explains: "A survey has shown that the effort required varies between 70 and 250 hours of manual labour per hectare." In view of escalating labour costs, it is therefore not recommended to cultivate beets in soils that are very prone to weed infestations.

The Nordzucker consultant is particularly interested in initiatives and technologies that minimise manual labour. His aim is to get hoeing machines as close as possible to beet rows. "GPS-controlled straight sowing and camera controls allow us to hoe closer to the crop rows, which reduces the area that



needs to be hoed manually." From the 6-leaf stage onwards, beets can be gently ridged up with a machine hoe. "The shares then bury the weeds", Hahnkemeyer continues.

### Hoping for innovative technology

He has high expectations regarding new technologies for recognising plants via cameras and specialist software: "Once this technology works reliably, hoes in which it is installed, or even autonomous systems, will reduce manual labour in crop rows drastically."



Thilo Hahnkemeyer (left) and Franz Hesse, both from Nordzucker AG, advise sugar beet growers on mechanical weed control.



## **A FARMER** ON HIS PATH TOWARDS DIGITALISATION

Johannes Paas hesitated for a long time before investing more intensively in digitalising his arable farming business. But new, user-friendly cross-vendor solutions have convinced him.

### Step by step

"The year in which I set my course towards Farming 4.0 was 2017", says Johannes Paas at the beginning of our interview. That was when Paas, a 38-year-old farmer from Ratingen in western Germany, bought a fertiliser spreader and a new Solitair seed drill. Both machines were to be controlled from a universal terminal. The obvious solution was therefore to use a CCI 1200. He gratefully accepted LEMKEN's offer to trial the new terminal in the field, and his decision proved to be right: Paas now controls a number of other ISOBUS-capable

implements via this terminal, which was developed jointly by several renowned manufacturers of agricultural technology.

But that was only one step on the path he has set for himself. "I then looked for ways to apply section-specific farming to my fields", Paas continues. Having conducted detailed soil studies, he was aware of how surprisingly inhomogeneous his fields actually were. "The My Data Plant application has provided me with satellite images of my fields since 2017, from which it creates application maps for my fertiliser spreader, for the use of plant growth regulators and sowing rates. I get new biomass maps every 10 days, and these help me to tailor the management of my crops to individual sections." Paas purchased the application offered by the Kleffmann Group because it is integrated with the agrirouter.

#### Focus on the agrirouter and CCI 1200

Until recently, the farmer used a USB stick to transfer data for the fertiliser spreader from his office computer to the CCI 1200. Now the agrirouter provides him with a much more elegant solution. Paas uses this data hub, which was co-developed by LEMKEN, to send his data directly to the CCI 1200. Data on all crop care activities performed is then transferred back to his computer. In this way, Paas is getting more and more familiar with Farming 4.0. His next goal is to integrate his machine and work data into his field database via the agrirouter.

#### Not a seamless switch

Paas is moving full steam ahead with switching from analogue to digital farming. However, the process has not been seamless by far, even though he describes himself as a technophile. To be on the safe side, Paas used both approaches in parallel during a one-year transition period, meaning that he kept planning and documenting his work in his Excel spreadsheets and manual field records. At the same time, he trialled his new, networked applications and technologies. Now he has arrived at a point where everything works largely the way he wants it to.

### User-friendly, compatible technology is essential

Two decisive criteria have made the technology useful for him: "For 30 years, agricultural technology manufacturers have been searching for a common language to allow applications, machines and tractors to communicate with each other. With the agrirouter and the CCI 1200, we finally have two successful approaches." Both are the results of cooperations between several manufacturers of agricultural technology. The number of companies supporting these works continues

> ↗ Johannes Paas and Hendrik Vennemann (LEMKEN) discuss the steps Paas took for digitalising his farming business.

ightarrow With regard to crop care technology, Johannes Paas relies on a LEMKEN Albatros trailed spraver with GPS-based width section control and automatic boom height control.

### Farm overview

- 375 ha arable farming
- 25 to 80 soil rating points, 70 field sections up to 15 km awav
- 850 to 1.100 mm rain. 10.1 °C annual average temperature
- Average yields per hectare: winter wheat and winter barley 8.5 t, winter rapeseed 4.2 t, sugar beets 80 t, winter rye 7.5 t, summer malting barley 6.0 t
- Machine park including: 2 tractors, 3 trucks, Albatros field sprayer 30 m, Heliodor disc harrow 7 m, 5-share Vario-Opal plough, Karat cultivator 5 m, Smaragd cultivator 3 m
- Additional revenue streams: 50 horses for agistment, agricultural and municipal services (compost and lime transport), leases



### **Benefits according to Paas:**

- The agrirouter enables compatible data exchange between devices, implements and applications by different manufacturers.
- Using the agrirouter reduces the risk of errors when employees complete jobs, plus the farm manager can make changes right until just before jobs are carried out.
- While the use of satellite maps generally saves neither fertiliser nor seeds or plant growth regulators, it allows farm inputs to be applied in line with actual needs.
- GPS-based section control in the LEMKEN Albatros trailed sprayer minimised overlap and thus reduced the application of crop care products by about 4%.
- The technology reduces operator strain, as fertiliser spreaders no longer need to be controlled manually, and manager workloads because there is much less effort required for documenting work.
- The cost of the necessary hardware and software is relatively low.

to grow, and the agrirouter consortium currently includes 13 agricultural technology companies. Paas believes that isolated solutions by individual manufacturers are a dead end. His decision for open cross-vendor systems give him the freedom to choose the technology he wants.

The second reason for his increased engagement with technology is that it has become considerably more user-friendly. "For me, technology needs to be easy and comfortable to control – not only for me, but also for my employees", he believes. The CCI 1200 impresses with a large display, for example, which is easy to read even without glasses. Plus its screen can be split to show several functions at the same time. The agrirouter's user interface is clear and intuitive to operate. "That's important. Otherwise,



dealers will be utterly overwhelmed with enquiries, and manufacturers' hotlines will be jammed", the farmer says.

#### Remote maintenance – a future step

While technology is improving continuously, not everything will run smoothly all the time. That's why Paas looks forward to remote maintenance systems, which are currently in preparation. Hendrik Vennemann, LEMKEN's Electronics Product Manager, comments: "This allows us to access implements directly. As a result, manufacturers' employees will no longer have to travel for hours, sometimes just to push the right button. This will save time and money."

### Looking at efforts and yields

"Everybody is talking about digitalisation as if it was a panacea, but it's not that it'll just work out of the box. I've invested a lot of energy in this", is Paas' conclusion at this stage. He is determined to go further along this path, though, because he is convinced it delivers benefits. And he likes to put his convictions into practice. He was, for example, only eight when he knew for certain that he wanted to be a farmer one day. Paas achieved this and, together with his father, converted a former leasehold operation into a large arable farming business with additional revenue streams. To conclude our meeting, he therefore recommends that interested farmers carefully weigh up efforts, expenditure and yields for their individual businesses and start with simple, open solutions.



### **CCI 1200:**

The CCI 1200 is the current generation of ISOBUS implement control. It is certified for data exchange with the agrirouter. The terminal features a 12.1" widescreen display and multi-touch operation at smartphone level. The terminal layout is flexible, allowing it to be used in both landscape and portrait mode or to be split. The CCI 1200 is therefore able to display several applications at the same time and perform the functions of two universal terminals.





### agrirouter:

LEMKEN and other manufacturers of agricultural technology have developed the agrirouter data hub in order to reduce data conversion problems and the number of communication interfaces in agricultural technology. The high degree of compatibility ensures that farmers benefit from the ability to use solutions from a wide range of vendors, which increases their efficiency in value creation, reduces costs and protects the environment.



## MAIZE SOWING: TRIANGULAR PRECISION DRILLING MORE SPACE

Farmer Marco Schreyer from the Schwäbisch Hall machinery cooperative likes to use new technology, even where proven solutions would be a safer bet. He looked for a solution that would allow him to fertilise his maize crops optimally with liquid manure even after sowing, while also protecting soils. That's why he now sows in a triangular pattern.

> Previously, when sowing maize, the row distance defined the slurry tanker's track width. But this track width was too narrow for the tractor with a slurry tank. Separate tramlines therefore needed to be created. The unique triangular placement system of the LEMKEN Azurit precision seed drill now offers his business a better solution.

### Twelve twinned rows

シュストウィアノンシントウィンドアノウシスティート

Marco Schreyer used the precision seed drill for the first time in 2018. It didn't take long for Schreyer, a 30-year-old farmer from Rosengarten in the Schwäbisch Hall district in Baden-Württemberg, to be convinced by the triangular placement system. "We used the 6-row folding model with 4.5 metres width and a module for under-root fertilisation." What makes this implement special is that it places seeds in a so-called triangular seeding pattern. It deposits individual seeds not in a single row, but instead

Text: Karin Homann

A look at the triangular pattern in young maize plants

### 2,527,900 hectares were planted with silage maize in Germany in 2017.

with some offset in two twinned rows spaced 12.5 cm apart. "Essentially you get not six individual rows, but twelve twinned rows", Schreyer, a qualified farm manager, explains. As a result, each plant has more room to grow."I could easily see with my naked eye that each maize stem was thicker. Given last year's drought, I didn't notice any increase in yield, though."

### How the technology works

At the heart of the Azurit precision seed drill is a singling unit comprising two synchronised perforated discs. This creates a precise, regular triangular pattern as each seed is placed. "At the start, I had occasional problems with blockages in the placing system, but that was soon rectified", the young farmer is happy to report.

If tramlines are needed, the seed scraper is set to its maximum position, which has the effect that no seeds are placed in one of the twinned rows. At the same time, the system ensures that the seeds not placed in the tramline are instead compensated for in the other row. "This creates a tramline 87.5 cm wide, which allows us to drive into the crop with tyres that protect our soils", explains Marco Schreyer. He is convinced that applying liquid by using this technology.

manure to maize makes good farming sense and is optimised The basic settings for sowing and singling are defined from the tractor terminal before sowing starts. A sensor monitors that these settings are complied with, and the system applies cor-The machine is equipped with a double disc coulter positioned rections if necessary. This prevents both overlap and gaps, as precisely between the seed placement system to enable unthis technophile farmer is happy to confirm. Each row can be der-root fertilisation. "The front fertiliser tank is unusual, and individually deactivated in the process. Schreyer believes that it is definitely more expensive to buy, but it ensures that the the machine's central seed hopper is a particular plus. Sensors weight is distributed better", Schreyer adds. distribute the seeds between the respective tanks. "They are



 $\uparrow$  The seed scraper is set to its maximum position to create a tramline 87.5 cm wide, with the effect that no seeds are placed in one of the twinned rows.

 $\psi$  Father and son: Marco and Gerhard Schreyer



### Sensor support

### THE SCHREYER FARM

Marco Schreyer and his parents Gerhard and Sonja Schreyer manage three revenue streams:

- The Schreyer dairy business with 100 dairy cows plus progeny and bull fattening; 170 ha, of which 90 ha grassland, 40 ha maize, 20 ha barley and 20 ha wheat
- Contracting: transporting slurry, planting maize, chopping, pressing bales, transporting grass and maize, crop care, swathing
- Biogas plant (400 kW) with attached heating network.

The farm works closely with the Schwäbisch Hall machine cooperative, with a machine leasing station located on its premises. The Schreyer family works across farms to utilise their machines optimally, and they work with temporary employees and farmhands and use the soil sampling service.

always evenly filled." Seeds are placed with great precision, even at a relatively high ground speed of 15 km/h. Schreyer's experience has shown that the sowing units maintain a steady position, and the large discs break up clumps of soil to create a uniform sowing pattern even if the seedbed is not very well prepared.

#### Use across farms

In view of the purchase price of €55,000, Marco Schreyer looks at the machine as a contractors' tool. "In our region, we have mainly small farms with fields often only

two hectares in size. Previously, it had been very challenging or costly to drive into maize crops without damaging soils, or it caused crop damage. Changing tractor tyres to adjust to the row spacing and track width also means extra work and therefore additional cost." For Schreyer, this precision seed drill has proven very effective, and he also uses it in his contracting work. The machine gets positive feedback from the Schwäbisch Hall machine cooperative as new options become available for machines to be used across farms.

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# THE FUTURE OF CHEMICAL **CROP PROTECTION IN EUROPE**

The number of active ingredients keeps going down in Europe. Must farmers get used to working with fewer and fewer chemical plant protection products? Jean-Philippe Azoulay, Director General of the European Crop Protection Association (ECPA) answers our guestions.



### Can you describe the current situation concerning the registration of active substances in crop protection?

We are seeing a large reduction in the number of new conventional active substances presented by our member companies for authorisation in Europe. For example, between mid-2016 and mid-2018, there were no dossiers presented for authorisation: a situation unprecedented for our industry in the last decades. The trend for re-registration of existing substances is also down. Many substances are not being put forward for re-registration by the companies, and some substances are proposed for re-registration but are unsuccessful.

### What are the reasons for this trend?

There a several reasons:

- 1. The requirements for registration have become very stringent.
- 2. The ever-increasing cost and time to market in Europe reduces the attractiveness for companies to invest in bringing new innovation forward.
- 3. The increased politicisation of the authorisation system makes it less predictable.
- 4. Finally, the evaluation authorities are often overwhelmed with work and cannot meet regulatory deadlines.

### Can you give concrete figures for the losses of active substances?

If we only look at synthetic substances, there were almost 1,000 active ingredients authorised in Europe in 2000. There are less than 300 today. And this number keeps going down, as existing substances continue to disappear and there are almost no new ones coming onto the market for the reasons mentioned above.

### In which cultures or applications will there be bottlenecks?

The bottlenecks are happening first in specialty crops such as vegetables, aromatic herbs and some fruits, where the size of the crop makes it economically difficult to justify preparing a full dossier for companies. This generates a multiplication of minor uses, a combination of crop and pest or disease in a given country, where the farmer has limited or no chemical solutions for protecting his crop.

### Can innovations and new registrations compensate the losses?

The pace at which products have been lost in Europe cannot be compensated by new registrations. The farmers' crop protection toolbox is shrinking, and it is becoming more difficult for farmers to produce some crops, even if alternative solutions are being developed, such as biologicals. We also note a huge increase in the number of emergency authorisations in Europe, which is a sign that the system is not giving farmers predictable access to the tools they need to protect their crops.

### Is it possible for farmers to react with agricultural measures?

Yes, different agricultural measures, or agronomic practices, can help. For example the choice of certain seed varieties, the type or the frequency of the rotation, the choice of mechanical ploughing. However, farming is always a question of trade-offs. These agronomic options can help facilitate crop protection, but they come with trade-offs in other areas, for example in terms of fuel consumption or profitability for the farmer.

### Is it possible to influence the social attitude and political pressure on chemical crop protection?

Our ability to influence the social attitude towards chemical crop protection is limited, but we are listening and actively working with citizens and politicians to continue to improve and change the way that our industry is perceived. Building confidence in the food that we eat every day, and the processes that go towards ensuring that we all have food on our plates, can only be to the benefit of everyone.

Farmers are the users of crop protection products. As such they are best positioned to explain to society how the products are used and how challenging it is to farm without them. This legitimacy gives farmers some ability to influence the social attitude and the political representatives. Even if this influence cannot be over-estimated, when they coordinate their messages, farmers can make things happen.



# SMALL AND LARGE STEPS ALONG THE CAREER LADDER

From the lecture theatre straight into practice – that's what is attractive for student trainees. Opening doors to challenging tasks for qualified professionals is where LEMKEN sees its responsibility. Both of these goals match very well.

Friederike Fell has been a student trainee with LEMKEN since February 2019. She works on issues surrounding the LEMKEN weather station. "At the same time, I boosted the 'women's quota' in the company a little", says the 25-year-old with a smile.

She studies industrial engineering in agribusiness at Osnabrück University, where she is currently in her 6th semester, and has already completed an internship with LEMKEN. Her main focus is on arable farming. "That's why I'm really happy that I'm able to work in crop care for LEMKEN." Her traineeship is mainly focused on tasks concerning the weather station. She is involved in developing an app and works on general digitalisation issues. She has even become a point of contact for external enquiries. "It's really interesting to build up an initial professional network "It's really interesting to build up an initial professional network

"It's really interesting to build up an initial professional network here within the company", says Friederike Fell about what makes her work particularly attractive. Flexible working hours concentrated around the semester breaks are another very welcome feature, and she likes the positive work atmosphere in Alpen. " I do feel as if I'm part of a family, and there's always somebody to answer my questions. I feel very much appreciated here."

The benefits for LEMKEN as an employer are also obvious. Student trainees are well qualified and able to make up for staffing bottlenecks after only a short period of induction.

"My time as a trainee at the LEMKEN headquarters is the best Trainees aren't at the bottom rung of the career ladder; they are preparation for this kind of task that anybody could imagine", already well on their way. Carlos Kunstmann is another good exis Kunstmann's view after just under a year in Germany. "I was ample. As his name already suggests, he has a background in two pleasantly surprised about the positive atmosphere within the cultures: The 29-year-old hails from Chile, where he also studied company and the amazing support I've received. You really feel engineering, and his ancestors originally emigrated from Germathat LEMKEN has remained a true family business, even though ny. The comparably low language barrier drew him to Munster, it's a company with worldwide activities. where he completed a Bachelor of Engineering, majoring in business management. In 2016, he returned to his home country, I cannot recommend a traineeship with LEMKEN highly enough. where he worked for LEMKEN and Grimme dealers. That's also There couldn't possibly be a better start to your career!"



Kunstmann's and LEMKEN's plans for the future overlap: The company would like him to help establish a new market for LEMKEN technology in Chile. "Chile and Germany as well as Chile and Europe are a good match", Kunstmann knows from experience. The Chilean agriculture is strongly shaped by European emigrants and their agricultural backgrounds. The technologisation of tillage methods on medium-sized farms is therefore of considerable interest for LEMKEN.

# Some information on Argentina The Argentine Republic lies in southern South America and is the continent's second largest country after Brazil. • Capital: Buenos Aires • Population: 45 million inhabitants

• Area: 2.766.890 km<sup>2</sup>

# **FROM ALPEN TO ARGENTINA** AND BACK

If a Chilean trainee travels from Alpen to Argentina to explain German technology to South American farmers, there's a story worth telling. And that's what Carlos Kunstmann has done.

I spent the last week of May 2019 in Argentina. My job there was new LEMKEN Rubin 10 and LEMKEN Karat 9 get to till Argentine capital Buenos Aires and travelled on from there to a farm near t Plata.

The farm was about 40 minutes' drive from Mar del Plata, and our was a potato farmer who cultivates potatoes for industrial use. 1,000 hectares of potatoes, 500 ha of which he leases, and employ

Efficient planning and logistics are important for him, because he parts of his fields with colleagues for crop rotation reasons. The aspect for our customer was that any organic matter would be in quickly and thoroughly. That's why we used both the Rubin 10 co harrow and the Karat 9 intensive cultivator.

These two machines were to solve the problems that the previously used the area for a field day. Our Argentinian field day technology had not been able to address: low working speeds of no more was a great success. Farmers were thrilled about than 6 km/h and poor mixing quality. The limited variety and range of the quality of work and design of our LEMKEN impleworking depths catered for by the old implements had caused compaction in the soil. However, the Karat 9 was able to loosen these. This is essential for growing potatoes, as it allows the plants to develop deep My short deployment to Argentina confirmed that the local market offers great potential for our implements.

By using the narrow (K6H) shares on the Karat 9, the customer was able to work to a depth of up to 28 cm, which had a great effect on the soil. The high operating speed and intensive mixing achieved with the Rubin 10 also impressed the customer a great deal.

I spent three days providing him with intensive training. On the first day, we looked at theory, and we then spent the other two



to ensure that	at the days taking the machines through their
oil. I landed ir	the paces on the fields. Employees were
ne city of Mar	del able to practise using the machines on
	the field, which gave them an opportunity
	to compare them directly to other South
local custom	er American machines.
e farms abou	t
s 40 staff.	They were happy to confirm all of these
	benefits:
rotates large	Better mixing
nost crucial	• Higher speed
corporated	More precise work with GPS
npact disc	• Fuel savings

On the last day, the farmer invited colleagues from

### **MORE TIME FOR AGRICULTURE** WITH SMART DATA USAGE

### DOCUMENTATION



Digitalisation can never replace farmers' work. But it can make their work easier! Our digital products, which we market under the name of iQblue, ensure more precisely targeted sowing, fertilisation and irrigation and support planning and documentation. That gives you more time. Our driving force: Your success!

NETWORKING



COMPATIBILITY

CURRENT WEATHER DATA



INTUITIVE OPERATION

-C-C-I

