

FOCUS



Fendt. The plus for grip and soil.

O Christmas tree
Where do German
Christmas trees come from?

MARS Project.
Forge into
new worlds with Fendt.

FROM THE FENDT ARCHIVES: 20 YEARS OF FENDT VARIO TRANSMISSION

Today, the name Vario transmission is synonymous with continuously variable transmissions in agricultural engineering. In 1995, Fendt introduced this revolutionary drive technology in the transmission of a Favorit 926 Vario. It was the hot topic at the Agritechnica that year. Many had their doubts that this transmission would establish itself on the market. Fendt customers, however, trusted the brand.



Today, 20 years later, nobody has doubts anymore about the decision to drive all Fendt tractors with the Vario transmission. With the introduction of the Fendt 1000 Vario, Fendt presented the Fendt VarioDrive drive train at the Agritechnica 2015.

The latest generation of the Vario transmission is completely manufactured in the Fendt production facility in Marktoberdorf. You will find more about the legendary transmission on **Page 44**.

CHRISTMAS IS SAVED FOR FENDT CUSTOMERS. YOU WILL LEARN WHY OUR TRACTORS STAND FOR GRIP AND ARE ALSO ESPECIALLY GENTLE ON THE GROUND ON PAGE 6.



Peter-Josef Paffen at the Italian agricultural equipment fair EIMA in Bologna.

Dear Readers,

Another year has gone by. A year with great challenges for farmers and agricultural machinery manufacturers. Ultimately, we are all in the same boat. From many conversations and through contacts, I can see that the downward trend has bottomed out. The situation will slowly continue to improve.

We provide you support by offering you innovative and high-quality machines that allow you to execute your work economically and smoothly. For this reason, we are investing in Research and Development, as well as Production, so that we can deliver you the best quality. Of course, that costs money, requires maximum commitment from Fendt employees and, most of all, this work never stops. Producing quality is a continuous task and a fixed part of the Fendt corporate culture.

»Producing quality is a continuous task and a fixed part of the Fendt corporate culture.«

In the same way, we also make sure that you can achieve the best results with the help of technical solutions. For example, we are placing special focus on the topic »Grip + Ground«. All Fendt series boast a low vehicle weight with a high payload. This provides enough room for versatile ballasting

options, because the only way to protect soil is with the right ballast. Because your soil is your capital.

The year 2017 will be distinguished by Fendt as a full liner: A full tractor line from 70 – 500 hp, a complete combine line, the Fendt forage harvesting machinery incl. our powerful forage harvester and, of course, the powerful services of our Fendt dealers and distributors.

I wish you and your families a wonderful holiday season and a successful year 2017.

Yours sincerely,
Your

Peter-Josef Paffen
Vice President and Managing Director Fendt
Chairman of the AGCO/Fendt Management Board

Contents



COVER STORY

- > 6 **Fendt. The plus for grip and soil. Why the Fendt brand stands for grip + soil protection.**

FENDT INTERVIEW

- > 12 Interview with Roland Schuler, Board Member of the BayWa AG.

FENDT WOMEN

- > 26 **O Christmas tree – a portrait of Verena Dünnebacke. The most popular fir trees in Germany come from her nursery in the Sauerland.**



FENDT TECHNOLOGY

- > 30 **We sow quality. You harvest reliability. Further examples of how Fendt manufactures quality.**
- > 34 Mission to MARS – cloud solution for location-independent robot control
- > 42 The perfect silage with Fendt. What influence does chop quality have?
- > 44 **Stepless in a new generation. 20 years of Vario transmission**
- > 52 New combine model for slopes. The Fendt C-series.

FENDT INTERNATIONAL

- > 22 Sweet cherries fresh from the fjord. A Fendt 200 Vario for fruit-growing in Norway.
- > 38 **Italian clan. The Cazzola contractors for maize harvesting.**

FENDT REPORT

- > 18 »We also want to create a buying experience here.« BayWa Technik-Servicezentrum in Bamberg
- > 54 **Harvest, where others spend their holidays. Fendt combines on the island of Rügen.**

FENDT NEWS

- > 25 Automated coupling with the 3D camera.
- > 25 Important trade show dates 2017.



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Fendt. The plus for grip and soil.

We develop technologies to allow you to work more efficiently and comfortably. But we also keep in mind that driving should be as gentle on the soil as possible. Because your soil is your capital. Our tractor ranges boast a low vehicle weight with a high payload. This allows enough room for versatile ballasting options, because the only way to protect soil is with the right ballast. Thanks to VarioGrip, you can adjust tyre pressure quickly and easily and distribute the weight over a larger area. Less air in the tyres, lots of air in the soil. More bars on the tyre make contact at once, so grip increases noticeably.

With these and many other exclusive Fendt technologies, you protect billions of small organisms, which are responsible for healthy soil and high yields, in every cubic metre of earth. Here are a few examples of how technology, performance and soil protection are connected.

Stepless soil protection

When driving over a field, weight and driving forces must be supported. This is an enormous stress factor for the soil. Thanks to the time-tested Vario transmission, Fendt tractors can convert high pulling power gently. Since there are no gears to shift and an infinite number of transmission ratios, there are no abrupt interruptions in traction that could damage the soil, especially during heavy draft work. Tremendous grip is available at all times, while the fine-pored, top structure of the soil is protected sustainably.

Release pressure

Driving in the field with a low tyre pressure increases the contact area between the soil and tyres. The larger the contact area, the lower the load on the soil, because the same forces are distributed over a greater area and do not penetrate as deep into the ground. With VarioGrip, you can conveniently choose the desired tyre pressure from within the cab. That

With VarioGrip, you can conveniently choose the desired tyre pressure from within the cab.

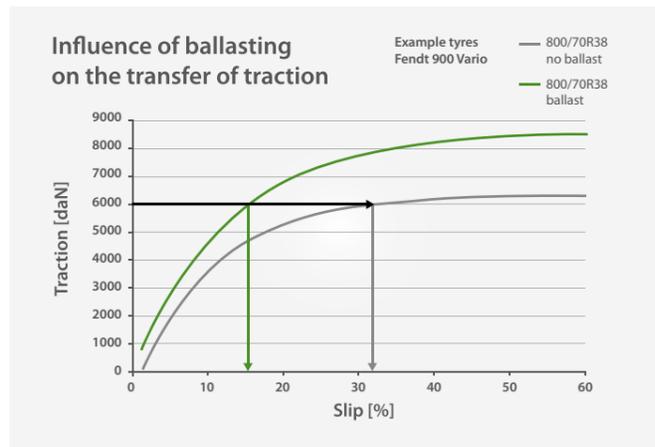
protects the soil, improves grip and increases yield. Because less air in the tyres ensures more air in the soil. With VarioGrip Pro, you even switch from perfect and safe road handling to optimal traction and maximum soil protection in just 30 seconds. Your investment costs for VarioGrip Pro already pay off after 2,600 operating hours. For your soil, VarioGrip Pro already pays off from the very first second.

Convert tremendous power gently – the time-tested Fendt Vario transmission makes it possible. And without shifting and interruption of pulling power.





The new Fendt VarioDrive drive train not only solves the rigid connection between the front and rear axle, but also problems with too little grip and too high soil compaction.



Optimum assistance

Changing implements and operating conditions demand flexible ballasting. Fendt Grip Assistant helps you find the best ballast for every operation, so you are always working with a lot of grip and the least impact on your soil. Because: with optimum ballasting, the same traction is achieved with half of the slip. Or, the other way around: For the same slip, it has a nearly 2 t higher traction*. Utilise the full potential of your Fendt tractor, preserve the full potential of your soil.

* (Dr Martin Heckmann, Grassdorf & Fendt Roadshow)



To convert engine power into forward propulsion in the best possible and most gentle way – no matter what kind of work or under what kind of conditions – the Fendt Grip Assistant quickly and easily helps you find the best ballast, the right speed or the optimal tyre pressure.

Efficiency ahead

All Fendt tractors have front axle suspension, which ensures that ground contact is never lost. It has also been trimmed for field operation and reliably prevents bounce through its specially coordinated damping, even during heavy draft operations. All the wheels always stay where they belong: on the ground.

Variable distribution

The new Fendt VarioDrive drive train realises a variable four-wheel drive for the first time and sets new standards for grip and soil protection. Needs-based torque

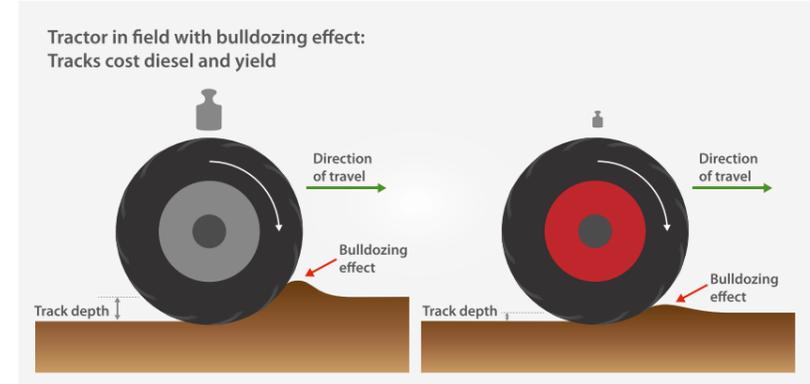
distribution means forces are transmitted to the ground, where they can be utilised the best, with minimal slipping. Since there is no rigid connection between the front and rear axles, the tractor does not have to work against a fixed lead at the headlands. The front axle literally pulls the tractor through the curve. This pull-in turn effect produces a small turning circle. This protects the soil, increases productivity and lowers diesel consumption, because unnecessary manoeuvring at the headlands is a thing of the past.

Tracks for success

Tractors sink into unworked ground, which has a lower load bearing capacity, so they are constantly driving against a minor height difference. 1 cm quickly means 10% higher diesel consumption! This so-called "bulldozing effect" does not stand a chance with the smart, lightweight construction of a Fendt. Fendt tractors have been designed to be as light as possible, to protect the soil and, thanks to a higher payload, as heavy as necessary, so that power is converted into traction, efficiently and gently.

Flexible ballasting

Thanks to different ballasting options, Fendt tractors can meet all demands. Changing implements and different types of hitches require different weights. At Fendt, even the wheel weights, from 130 kg to 1250 kg per side, can be mounted and removed eas-



Ballasting options: Fendt offers you up to 24 different combinations of front and wheel weights. Fendt solutions are just as versatile as your tasks.



Intelligent lightweight design: Measure success by yield, not by tracks in the field. Fendt tractors are up to 4 tonnes lighter than comparable competitors.

ily. Five front weights, which offer the right weight for every application, are available from the factory.

Dual for more traction

Dual tyres generate the best traction for the best soil protection, because they distribute the operating weight over twice the area. For maximum pulling power, Fendt dual tyres can even be used in combination with wheel weights.

Need-based locking

Fendt tractors offer 100% locking on both the front and rear axles. So there is always enough grip, even under the toughest conditions. With the Locomatic self-locking differential in the front axle of the Fendt 200 Vario P to 800 Vario series, the lock does not even have to be activated manually for full grip, it does it automatically. What you feel is the plus in grip. What you see is the plus in soil protection. What you harvest is the plus in yield.

Intelligent front

When working with front-mounted implements, the front linkage with load relief control ensures that the weight of the implement is transferred reliably to the front wheels. So there is always enough grip available and the sensitive soil is protected reliably.

Automatic differential and four-wheel drive locks:

You do not have to worry about the best way to move forward. Fendt takes care of that for you. Efficiently, fully automatically and gently. For your soil and your yield.



Minimum slip

In order to convert power into traction optimally, Fendt tractors can keep wheel slip reliably low during cultivation work, thanks to the electronically controlled rear lift. This way the upper layer of soil is not subject to unnecessary loads and efficiency increases.

Smart guidance

Through optimal utilisation of the working width, the VarioGuide guidance system prevents unnecessary passes, in both worked and unworked areas. That protects the soil in the long term and increases performance.

You will find more information
on our homepage www.fendt.com



Maintain the structure of the soil by minimising slip. Leave a lasting impression with power and efficiency, not with unnecessary tracks.

THERE IS ONLY SO MUCH SOIL

Every day, some 74 hectares of precious arable land are lost through development alone. A quarter of nearly twelve million hectares of farmland in Germany is at a very high risk of erosion, through wind in the North and rain in the South. Every year, some 100 to 1000 kg of soil per hectare are regenerated. In relation to the total area, that is only one hundredth to one tenth of a millimetre!

With state-of-the-art cultivation, tillage and plant protection technology, farms can help supply the growing world population by maximising yield above the ground. Under the ground, billions of small organisms ensure that your seeds develop properly. These include earthworms and insects, which tunnel through the earth and loosen up the soil, as well as single-celled organisms, algae and bacteria, that are present in the soil: they all contribute to the formation of humus and increase our yield.



»We know where we come from!«

Roland Schuler studied business at the University of Stuttgart with a focus on Engineering. He has been a member of the board since 1993 and, starting 1997, also Spokesman for the WLZ Raiffeisen AG Board. In 2002, after the fusion of the WLZ and BayWa, he became a member of the board at the BayWa AG. In 2003, he took over BayWa Engineering, 2006 the division for Classic Energy and in 2008 also Regenerative Energy. Since 2015, Schuler has been responsible for BayWa Agri Services with the management areas Agricultural Sales, Engineering and Digital Farming. He was born in Swabia, is married and has two adult sons.



Roland Schuler at the Bayerischen Zentral-Landwirtschaftsfest (Bavarian Central Agricultural Fest) 2017.

Digitalisation, globalisation, connectivity, etc. – continual development is crucial for companies in order to succeed in international competition. Despite this, the BayWa wants to remain a reliable partner for their customers and maintain personal contact.

We are talking about digital and analogue proximity. The latter through our many locations, where we are in direct contact with customers. The digital offers supplement the personal contact. This means that we will always have machines that have to be repaired in a workshop or at the customer's location. That way human relationships are maintained. In the future, however, fields of work will be created, for example in

telemetry, where the machine reports a fault, even before the customer notices it. In this way, we aim to minimise machine downtimes. And we will only succeed in doing this, if we take advantage of the benefits of the digital world. The digital world and human contact complement each other very well.

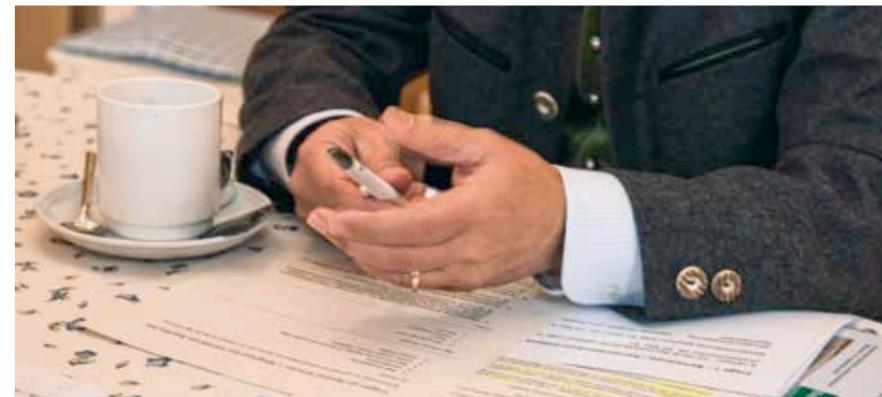
Customer data, machine data and general data protection are important keywords here. How do you handle this sensitive topic?

If someone wants to, there is theoretically always a way to hack data. It would be wrong to believe that a computer under one's desk is more secure than the data in a cloud. Cloud solutions are better protected than a PC at home. For us, data security is a very important topic.

With our cloud solutions, we guarantee that both the computer and back-up systems are located in Germany. They are therefore subject to German data protection regulations, which are some of the strictest in the world. We can therefore guarantee the highest possible level

»Fields of work will be created, where the machine reports a fault, even before the customer notices it.«

of data security for our customers. In the long term, however, there will be changes in the attitude towards data. As soon as farmers recognise the benefits,



Roland Schuler has also been responsible for the area of Digital Farming at the BayWa since 2015.

they will be ready to contribute their data. If, for example, I look at solutions in the USA today, which bring together diverse data from different farmers in a region to allow recommendations for the cultivation of individual fields, well, this can only be a benefit for all those involved.

What does BayWa already offer its customers today?

The digital offers from the BayWa primarily address the question: What do farmers need? Similar to the process chain, we try to provide farmers with all of our offers. For example, site-specific sowing or fertilisation.

We would like to give them concrete offers, ones that will provide economical support, i.e. to reduce their use of operating inputs. These also help the environment, because fertiliser and pesticides can be brought out according to need through targeted application. This sustainability also helps to improve the image of farming.

A BayWa branch office as an important location for customers – as a professional contact person, what do you want to offer farmers and contractors here?

Farming has been undergoing a continual structural change for a longer time now. Of course, we are always adapting ourselves here. However, just offering a workshop is not enough anymore. The

maintenance intervals of agricultural machinery keep getting longer, at the same time, distances are no longer a big topic for customers. Today they want performance and that is what we have to deliver. I like to compare this with a patient. If I only have the sniffles, I will go to a general practitioner. If it is pneumonia, then I will go to the hospital. And if it is even more serious, then I will go to the university hospital. That is the way we have to present ourselves as dealers: Fast help for acute problems close to the customer, if it is more serious, then a specialist needs to look at the machine in a service centre.

So the mix is, so to say, your recipe: from the “remote diagnostics”, to the “family practice” up to the “house call” – you have to have everything, so that farmers choose BayWa as their dealer?

»As dealers, we have high expectations from a premium manufacturer like Fendt.«

In the past 5 years, we have invested 35 million euros in efficient branch offices and opened 22 new ones. In 2017, we will invest another 18 million euros in

our locations to modernise our service network. We not only do that in economically high phases, but constantly. An example: This year, the most modern parts warehouse opened in Rößlein – the biggest single BayWa investment in a building ever. Customers can pick up their replacement parts here, can have them sent to them or delivered through the workshop. Our goal: the lowest possible downtimes for customers. Perhaps someday farmers will receive their parts by drone and the service person will only come to the field to install it.

The BayWa and Fendt already have a strong partnership that spans decades. What do they demand from the Fendt brand and Fendt products?

We, as dealers, have high expectations from a premium manufacturer like Fendt, because our customers also buy premium quality with a Fendt product. Fendt has its price and it also has to justify this through above-average quality. Our customers are willing to pay more for this.

Of course there are also downtimes with a Fendt, but in general, Fendt customers have always been supplied with excellent quality. In addition, we, as distributors, work closely together with Fendt, because a premium product also needs premium service.

Moreover, we expect further technical innovations from Fendt, which are often surprising for customers. This also

applies to the provision of machine interfaces for digital services. Customers are already working on the digitalisation of their farms. They want to use machine data to test the planned working and harvesting results and to fine tune them. That is smart farming.

Apropos smart farming.

Where do you see fields of development for the BayWa?

Agriculture 4.0 will establish itself with a snowball effect. Nearly every farming enterprise with more than 300 hectares already has a documentation or farm management system. Now we are also making it possible for small and mid-sized farms. And as soon as the customers notice the benefits, digital applications will develop very quickly.

For two, three years, the “internet of things” has rapidly been making its way into farming. Farming is also starting to occupy itself with such developments, to develop possible benefits from it. The more cost-effective and, most of all, the simpler the solutions are, the faster they will establish themselves. For a good year now, our subsidiary “FarmFacts”, has also been offering “NEXT Farming” in addition to our successful software “AO Agrar Office”, which offers smaller farming business access to digital solutions.

BayWa stands for “Bayerische Warenvermittlung” (Bavarian Commodities Brokerage). How does that fit to a

publicly tradable company that operates on a global level?

We are aware of where we come from! We come from here, the Bavarian region, and are strong here – and we want to keep it that way, too. We also know that if we only remain in this region, we will lose our strong market position in the medium term, due to the increasing international alignment of all of our markets. So we have to get involved internationally, and also invest. That is not a really easy path. We have BayWa dependencies on all continents.

»We have BayWa dependencies on all continents.«

And at the same time, if you become international, you have to take the people with you. For example, when I travel in Africa, I am pleased at how much trust there is in us. Our aim is to work together with local colleagues on our international markets just as well as we have always be doing on our home markets.

You just mentioned Africa as an example. What is BayWa’s strategy for Africa?

Sub-Saharan Africa is one of the most important growth regions for agriculture due to its unexploited and unpro-

ductively farmed arable land. Through our joint venture with our South African partner Barloworld, we have taken the first step for an agricultural machinery business with AGCO products. Our plant production experts provide consultation for the AGCO Future Farm and were already able to bring about major improvements. We also provide training to enable people to take over the work themselves – both in regard to agricultural machinery and plant production. The local challenges show just how important digitalisation will become. For example, we are able to provide consultation for a test farm in Africa – for the most part we did this remotely from Germany using satellite data. The site-specific application of fertiliser has already been done on five test fields with a total of 900 hectares and now, at the end of the year, we will see if it has paid off.

Let’s take a look at the upcoming year. What do you expect in 2017?

A glimmer of hope is emerging that agriculture will be improving in Germany in 2017. A first indicator is that the milk and meat prices have recovered a bit. Furthermore, we expect dynamic development regarding digitalisation in agriculture.

Thank you for this interview. This interview was held by Manja Morawitz.



» We also want to create a buying experience here.«



National winner of AGRARTECHNIK Service Award 2016:
44 employees at the BayWa location in Bamberg.



The BayWa Technology Service Centre for the region Franconia, which includes the international pre-owned machine centre, lies adjacent to the Bamberg harbour. The modern location was opened in December 2014 after a year of construction. The BayWa AG invested six million euros in the location.



Managing Director Günter Schuster, "The customer centre here is 100% available to all BayWa field workers with their customers."

Young Martin Linz listens very carefully while his father Sebastian and the deputy workshop supervisor Ralf Lamprecht talk about "his" tractor. The family farm's Fendt 720 Vario is in the workshop for inspection. "Ever since we have started with Vario, our dealer has been the BayWa Bamberg, although we are situated 30 km away," says the farmer. "This is where I find the know-how I need for the electronics." Sebastian Linz has been driving with the VarioGuide automated steering system for two years now. "I cannot imagine working without an automated steering sys-

» You can't avoid technology. We have to have a lot of training programmes, at Fendt, too.«

tem anymore. In the first year, I prepared the seeds the way I usually do. I didn't expect that so much would be left over at the end. With an automated steering system, you mainly save on seeds, fertiliser, pesticides and, not least, fuel and time. It also allows me to easily upload the field data onto my other tractor with a USB stick, and then I can follow the tramlines perfectly, for example in the spring, when I apply pesticides in the rapeseed field.

Modern workshop concept

You know that customers are satisfied with the service, if they come again. Competent employees and a sophisticated workshop concept play a vital role here. "We have to deliver the service that our customers expect," says Ralf Lamprecht, explaining the workshop concept. "This includes bringing customer machines into the workshop and taking them back to the farm in the evening. Customers appreciate



Farmer Sebastian Linz with his son Martin. There are currently a Fendt 720 Vario and a Fendt 513 Vario with front loader on the family farm.

that and we are happy to do it," says the deputy workshop supervisor. The workshop team comprises 14 employees, including four trainees. "Our customers are enthusiastic, because we have many young employees. They are interested in electronics – using a laptop is normal to them," says Lamprecht in his friendly Franconian dialect. "You can't avoid technology. Because technology is constantly changing nowadays, we have to have a lot of training programmes, at Fendt, too."

Along with the new construction of the BayWa location in Bamberg, the workshop was adapted to modern technical requirements with a 3.5-million euro investment. Special tools are available for all types of machines. In the large bright workshop, the new crane can now lift the big tractor without any trouble. "I especially like the drive-thru store on both sides of the workshop. It saves us manoeuvring time when driving in or out of the workshop," says Ralf Lamprecht, pleased with his new hall. "And we also have a separate washing hall; the winter maintenance machines can drip dry there. Our workshop stays clean and dry."

A location for all

The new technology servicing centre is located on 56,000 square metres. A photo voltaic system on the facade delivers up to 30 percent of the required electricity. The BayWa central administration and material planning for the entire region of Franconia is accommodated here. The friendly atmosphere can already be felt when entering the building. There is no dark hall flanked by offices on each side. The large foyer in the ground floor is also a communal space and looks like a cafe. The employees can meet here, have conversations or talk with customers and suppliers. Fresh fruit is available for free for everybody. If

you go up to the gallery, you will find Günter Schuster's office on the right-hand side on the first floor. The managing director of the Bamberg location and the BayWa Engineering division for the region of Franconia is a BayWa institution. This year he celebrates his 40th year at the company. "The last few work years, in particular, have been more fun than ever," laughs the energetic manager. "The feeling that you are able to move something, motivates us all here. Absolute honesty is top priority for me. That is the only way that a true partnership can work. Also with manufacturers, like Fendt." Their success confirms that the staff in Bamberg was right. As a market leader, they had a market share of 25 percent – over

»Absolute honesty is top priority for me. That is the only way that a true partnership can work.«

28 districts – in the past year. Schuster explains the success as follows: "We are successful at integrating people. All of our employees are taken along and supported, so they can become successful. And we are also authentic and trustworthy for our customers. Customers must be 100 percent sure that they can rely on us, that they will be treated fairly and receive good consultation and that the machines are in order."

This applies to new machines just as much as to pre-owned machines. When the location was planned, we also planned a concept for the international pre-owned machine centre. Generous outdoor presenta-

The trainees receive training as mechatronics fitters for agricultural machinery.



Clever employee idea: Spare parts depot for late pick-ups. Customers get a text message with the code to open it.



Siegfried Seeber supervises the workshop. His deputy Ralf Lamprecht (top) has been working for the BayWa for 21 years.



tion areas as well as a new exhibition hall are open for customers. Even on Sunday! "Every Sunday, some 70 people now come from up to 100 km away without any advertising to speak of. On Monday they go to their sales representatives and speak with them about the machines they have looked at," explains Günter Schuster, proud that this concept is such a success. "We also want to create a buying experience here. All field staff within a vicinity of 100 km can come to us with their customers. They are able to look at machines, take test drives, eat a Bavarian Weißwurst and feel at home. I want farmers to say to themselves: This partner takes me as seriously a customer," emphasises the managing director. His staff shares this conviction. "The work atmosphere suits us," confirms the deputy workshop supervisor Ralf Lamprecht. He has been working for the BayWa for 21 years now and, in addition to the work-

shop, is also responsible for the pre-owned machines. "It is important for Fendt that the machines have a high resale value. Business transactions come about this way, because customers out there know that they will ultimately get back more. Different makes with the same number of hours are already a lot cheaper." Farmer Sebastian Linz confirms that, too. The Fendt 720 Vario is already his seventh Fendt tractor. "We have been driving tractors from the Fendt brand since 1988. We bought this one here in 2012." And in answer to the question, if his son Martin is interested in technology, the 32-year-old farmer smiles. "Martin might not be able to read yet, but he knows every button on the keypad. And often he has to show grandpa which button to press."



Sweet cherries from the fjord



Eivind Hellum has invested in a Fendt 211 Vario in the narrow track version for his cherries. The bustling farmer from Svelvik in Norway has already been driving a Fendt 208 Vario V for ten years now. In his opinion, optimally functioning equipment is the be all and end all.

"About 10 years ago, I bought a Fendt 208 V with 85 hp. I was very satisfied with it. It was mainly used to mow on the plantation, fertilise, spray and chop branches," explains Eivind Hellum.

"Now I need a somewhat bigger tractor to serve as a draft machine for my trailed sprayer. We decided to buy a Fendt 211 Vario F with a 110-hp engine and a width of 1.36 metres. This tractor is perfect for our needs," says the farmer from Svelvik, a community 60 kilometres southwest of Oslo, located directly on the Drammensfjord.

Together with his brother Gjermund and his son Viktor, he manages the fruit-production company Hellum Moreller. Its growing areas are subject to the rapidly changing Norwegian wind and weather. That is why it is extremely important to him that his equipment works perfectly at all times.

"Fendt offers outstanding quality. Furthermore, there are as good as no problems with the tractors. The narrow version is ideal for fruit production. It allows us to drive through the rows of trees. The front and rear PTO are also very practical, especially when things are tight."



He manages the cherry plantation Hellum Moreller together with his brother Gjermund and his son Viktor. The newest Fendt tractor joined the farm last year. Amongst other things, it is used to tow a heavy trailed sprayer.



Made for fruit-farming

The Fendt 211 Vario is the top model from the 200 V/F/P series. The V-version is a model for wine-growing, while the F-model, which Hellum bought, is meant for cultivation with wider spacings. The P-version is the widest model. All Fendt 200 Vario series have been equipped with the incomparable Vario transmission since 2009.

"The new tractors offers all the equipment we need for our purposes. My brother has driven it the most up to now, but I am also learning how to handle the Vario transmission," laughs Eivind Hellum.

Fuel consumption measurement is standard specification for all models. A whole range of equipment features are available. A quiet, dynamic 3-cylinder AGCO Power engine is found under the bonnet, which, relative to the tractor's weight of under four tonnes, is extremely powerful.



“The low depreciation and low operating costs are important to us. We also have to feel good in it, because we sit in the tractor every day.”

“The combination of compactness and strength make the tractor a real bundle of power,” explains Hellum. Since he joined the family-run farm in 1985, he has been growing cherries for Bama. The fruit plantation lies on a southern slope of the Drammensfjord. The slopes ensure natural ventilation under the covering. This is required to maintain stable warmth. “Even if I pull a 1500-litre trailed sprayer up the mountain, I do not have to worry that there is not enough power,” says the fruit-grower explaining the safety aspect of his new tractor.

Fruit-farming is increasing in Norway

Morelle is the name of an old French variety of cherries. In Norway, all sweet cherries are generally called that. Svelvik is the fifth largest fruit-production district in Norway.

The industry is growing. The new generation of fruit producers in the area have specialised on apples, plums, raspberries and strawberries,” explains Hellum.

The warmth and sun give the cherries their sweetness and aroma. There are many factors that farmers cannot control. That is why you have to concentrate on the aspects of growth that can be influenced. “Drainage is important to keep roots from standing in water. That racks up numerous hours in the tractor. That is why the outstanding driving characteristics of the Fendt 200 Vario series is a real advantage,

because the tractors offer exceptional sitting comfort and good visibility over the terrain.

Satisfied with the service

Fendt is known for its solid tractors, which are very economical. Hellums new tractor was delivered from by Rune Teigen from the Eiksenteret Lier dealership. “I am very satisfied with the support I have received from them. That goes for the salespeople as well as the mechanics from Eiksenteret. I just had a mechanic on the farm, who inspected both 200er models and replaced the oil filter and oil,” he reports. “Ultimately, it is not the purchase price that is decisive, but rather the total cost of ownership. For us, the low depreciation and low operating costs are important. We also have to feel good in the tractor, because we sit in it every day. It is our workplace, after all. Furthermore, it is always a pleasure to look at a beautiful tractor,” concludes Eivind Hellum.



The Fendt 211 Vario F fits between the rows of cherry trees in Svelvik.



BLE Innovations Days in Bonn: A Fendt 724 Vario automatically couples to the Fendt Slicer.

Automatic coupling via 3D camera

Cultivation vehicles that connect to the tractor all by themselves? That is still in the stars! Not completely. A project for assistance and robotic systems has been running for approx. 2.5 years at the Institute for mobile Machines and Commercial Vehicles at the Technical University of Braunschweig. The joint research project between the University and AGCO/Fendt was exhibited at the BLE Innovations Days in Bonn on the 25th to 26th of October.

A Fendt 724 Vario automatically couples the Fendt Slicer mower. Tobias Blume from IMN describes the assistance system, which is based on a rear-facing 3D time-of-flight camera for tractors as follows: “The system has three main functions, on the one hand, the automation of the coupling procedure, on the other, a manoeuvring assistant and additionally collision prevention. We tested the collision prevention with our colleagues. The system detected the person in the driving path,” smiles Blume.

The time-of-flight camera can detect the area behind the tractor at a distance of up to seven metres and display different implements in the form of a cloud of points. Using an algorithm, the exact position of the implements and the tractor can be determined and then the optimal path for coupling can be calculated. It is controlled, for example, using a PC and can be operated with a smartphone. The operator monitors the system, but does not need to steer and control it

himself. The assistance system is a step towards autonomous driving and is meant to help inexperienced operators handle big machines.

“Until now, it has mostly been farmers that are interested in technology, who have been enthusiastic about our system. They also ask a lot of questions about the different components of the system and are really interested in testing it for themselves,” says Blume, summing up his impressions from different trade fair visits up to now. “Assistance systems often need a test run to be convincing, because only then do its benefits become tangible. We mainly see long-term benefits for large farming enterprises with many employees and for farms, which must change implements frequently. Ultimately, we want to make daily work easier for farmers.”

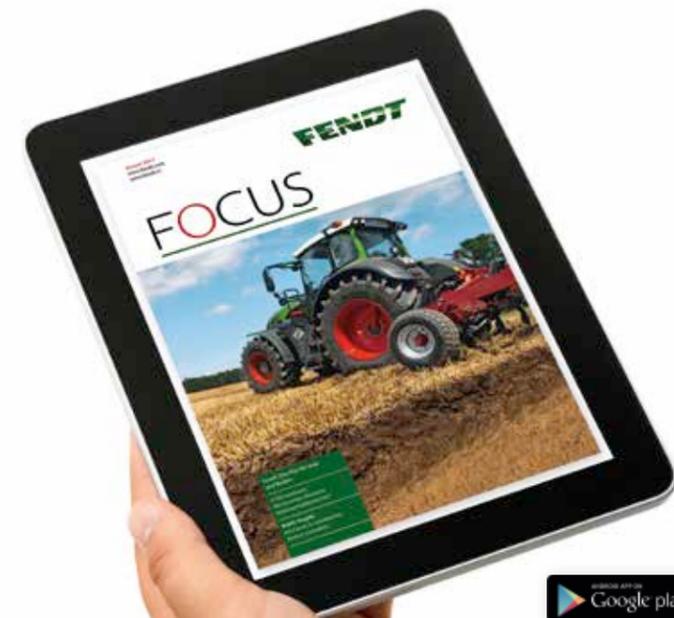


EIMA international agricultural equipment fair in Bologna: Here the Fendt 1000 Vario was one of the highlights of the exhibition in November 2016.

Important trade fair dates 2017

We will be presenting our new machinery at the following major trade fairs in 2017. You are invited. Visit us at the Fendt Stand in 2017. We would be happy to present our new products and services to you.

January 2017		
20 - 29.01.2017	International Green Week	Berlin
February 2017		
23.02. - 26.02.2017	Tier und Technik (Animals and Technology)	St. Gallen
26.02. - 02.03.2017	Sima	Paris
March 2017		
16.03. - 18.03.2017	Wieselburger Messe, INTER-AGRAR	Wieselsburg
May 2017		
04.05. - 07.05.2017	Agra	Leipzig
July 2017		
07.07. - 10.07.2017	Tarmstedter Ausstellung	Tarmstedt
September 2017		
06.09. - 10.09.2017	Rieder Messe	Ried im Innkreis
14.09. - 17.09.2017	MeLa	Gülzow-Prüzen
November 2017		
12.11. - 18.11.2017	Agritechnica	Hanover
January 2018		
12.01. - 14.01.2018	Alpen Adria agricultural trade fair	Klagenfurt



You will find the new Fendt Focus in the Google Play Store for Android devices and in the App Store for iPads.



O Christmas tree

The Caucasian fir is at home from the Caucasus to Georgia and up to northeastern Turkey. "It is the most popular Christmas tree in Germany," says Verena Dünnebacke from experience. With her family, she primarily cultivates Caucasian firs. And the demand is increasing. In Germany alone, some 23 to 25 million Christmas trees will be sold this year.



The agricultural equipment dealers Willi Better from Büren near Paderborn (left) and Fendt factory representative for Westphalia, Dirk Fraune (right) are good partners in technology. The Betten KG can look back at a long history with Fendt.



Besides playing the organ and singing in the choir, another one of her hobbies is hunting. All three help her balance her daily life.



Fir trees as far as the eye can see. The plantation begins to the right, next to the farmstead of the Dünnebacke-Strugholtz GbR in Effeln, and reaches up to the edge of the timber forest. Some 6,000 young trees are planted on a hectare when they are three to four years old. "The trees are harvested starting with the 5th year after planting. The number each year depends on the age and quality of the trees. The latter, for example, can vary depending on the source of the seeds and the location," explains Verena Dünnebacke, as she walks across the wide farmyard. Past the white stucco house on the left, the adjacent office building, through the barn, directly to the surrounding Christmas tree plantation. Red, white, blue and violet paper strips hang out of the pocket in her vest. She labels the Caucasian fir trees with them. The colour stand for size and quality, and therefore ultimately for the price of each tree. Now, in the late morning, when her two-year-old daughter Anna is

Christmas marathon: Both Varios take care of the transport and loading work during harvest time.

sleeping, the young mother uses the time to work. In the meantime, her husband, Peter Strugholtz jr., checks the tree stands, which are harvested in mid-November with the latest technology. Verena Dünnebacke inherited the Christmas tree farm in Niedermarpe in the Hochsauerland District from her father and Strugholtz, jr took over his parents' farming and forestry company in Anröchte/Effeln in the district of Soest. Now, together, they mainly cultivate Caucasian firs and some hectares of

Verena Dünnebacke in the Sauerland on a plantation with blue firs, which begins right behind her farm.



PRODUCING REGIONS

According to the National Association of Christmas Tree producers (BWS), the producing area for Christmas trees in Germany is between 30,000 and 50,000 hectares.

Of these, North Rhine-Westphalia has the largest cultivation area in the country, with 18,000 hectares, 12,500 hectares in the Sauerland alone. Other large production areas are found in Schleswig-Holstein and Lower Saxony, smaller ones in Bavaria and the Rhineland-Palatinate.



The Christmas trees are readied for delivery with the aid of a palletiser. Depending on the size of the Christmas trees, about 100 trees fit on one pallet.

blue spruce and Norway spruce on more than 100 ha, which is mostly their own farmland. In addition to Christmas trees, the farm has some 100 ha of forest and 30 ha of grain.

“I never wanted to become anything else!”

This all requires excellent organisation. After labelling the trees, Verena Dünnebacke, still has a lot to do in the office today. She takes care of sales, conscientiously and calmly. The customer is king. “For example, for years we have had a regular customer on Mallorca, who picks up his goods himself,” she reports. That is exactly what fascinates her on her work. It is interesting and multi-faceted. “I never wanted to become anything else”, she laughs. And she knows what she is talking about: she was already confronted with the production of Christmas trees on her parents’ farm when she was a child. That is why she went to the Benedictine High School in Meschede. And graduated with a degree from the Academy of Business and Administration in Lippstadt in its co-operative education programme. And

the young entrepreneur still wants to do a lot more. She is planning to further optimise the working processes in the business. On the one hand, to save costs, on the other, so the trees can grow better and more uniformly.

Ready for the Christmas marathon

While she is busy taking care of customers, her daughter Anna is at her grandparents’ Christel and Peter Strugholtz, sr, and is zipping around the farmyard in her Fendt pedal tractor. Verena Dünnebacke is thankful that she receives support from both her parents and her in-laws. “Only if the family works well together is it possible to manage such a complex business at two different locations,” explains the young woman. Further education, info events – that also belongs to her job.

But not only Anna’s pedal tractor has a place in the large farmyard. Two Fendt tractors stand there, spotless and ready for the Christmas marathon. While the Fendt 820 Vario and Fendt 415 Vario are mainly used for crop care and planting on the plantation, they also do transport and loading work during the harvest season. Important advantages are the manoeuvrability, stepless control and economy of the powerful Fendt tractors.

Long tradition in the Sauerland

Verena Dünnebacke won’t be finished with work for a while. After work in the office, she makes her way to Niedermarpe, where she grew up. A small village between Meschede and Olpe, comprising twelve houses, most of which are half-timbered. In the middle is the Dünnebacke property. A big farmyard with barns and other buildings. The farm’s own chapel, which can be reached from the main road and the small Marpe bridge were erected in 1680.

»We have a regular customer on Mallorca, who picks up his goods himself.«

She jumps out of the car and greets the construction workers, who are renovating the house. She quickly talks through some details with them. Her 72-year-old mother, Luzie Dünnebacke, joins them to clarify the procedures for the next few days. Her father, Wilhelm Dünnebacke, who already passed away in 1999, began planting Christmas trees in the 1960’s. A long tradition. The Sauerland is the largest contiguous cultivation area for Christmas trees in Germany. That is primarily due to the nutrient deficient soil and the hilly topography. But now Verena Dünnebacke has to hurry. Because she has made arrangements for hunting this evening. She already got a youth hunting license when she was 17 years old. “Hunting



Grandparents Christel and Peter Strugholtz sen. with grand-daughter Anna (centre).

belongs to our farm. I wanted to do justice to that,” she remembers, while she gets her hunting things out of the house. She will go to the raised hide with her husband today. “We not only work together, but also have a hobby in common,” she says happily.

Active support from her parents

When the last trees are sold on the 24th of December, the salespeople meet on the farm in Niedermarpe and are received by Verena Dünnebacke and her husband. At this time, her in-laws and Anna are waiting for her for Christmas dinner in Effeln. “We look forward to this time together,” she comments. Today, the demands of a young, modern family-run company are very high. Increasing bureaucracy and regulation of the use of pesticides increase the amount of work that needs to be done.

Only with the active support of parents on both sides of the family is it possible that the Christmas Tree farm in Anruchte/Effeln and Niedermarpe functions smoothly and the owners also have time for family life and hobbies.



Verena Dünnebacke and Peter Strugholtz got to know each other on an excursion in Denmark, which was organised by the “Christmas Tree” Task Force of the Westphalia Chamber of Agriculture.



A relatively wide spacing of 1.10 m is left between the firs. This gives the firs enough space to grow uniformly to all sides.

THE CRADLE OF CHRISTMAS TREES

The first decorated Christmas tree is rumoured to have stood on a public place in Riga in 1510. Today a memorial plaque commemorates the tree. But there are also references of Christmas trees being set up in the guild houses in Strasbourg at about the same time. For a long time, they were only found in wealthy circles. Only at the end of the 19th century did Christmas trees make their way into all social ranks.



A production line for all tractor series:
from the Fendt 200 Vario to the Fendt 1000 Vario.

We sow quality. You harvest reliability.

Everyone has their own yardstick for quality and makes their own personal verdict. It could be about a delicious wine, a well-crafted chair, a comfortable mattress or a tractor. When we invest our money in quality, we expect more than just a functional product. We also expect the manufacturer's devotion to their product.

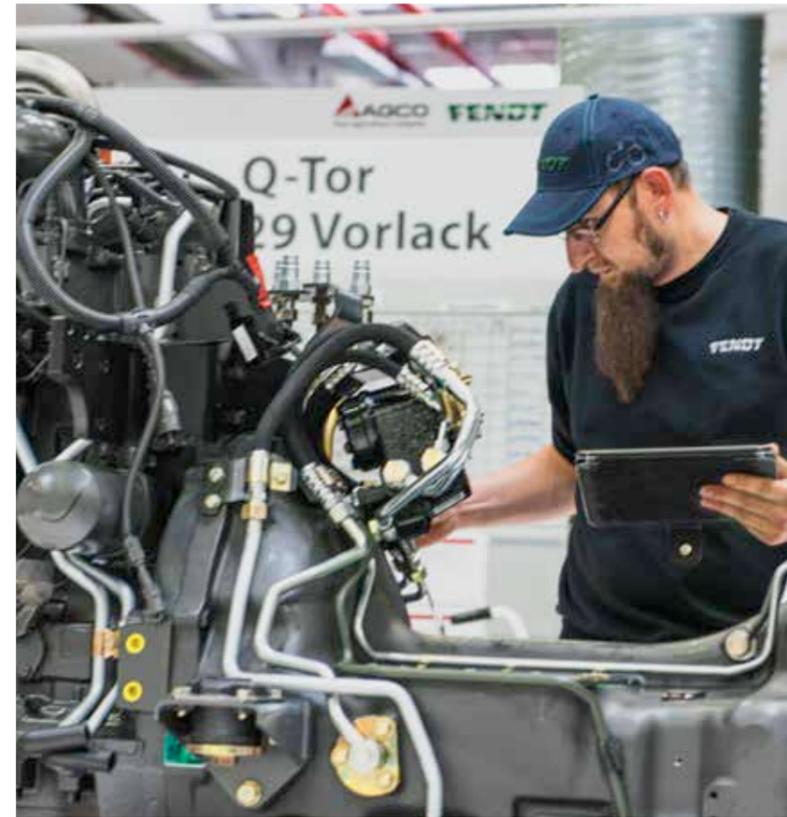
In the last issue of Fendt Focus, we already revealed the different ways we work to produce Fendt quality. In this second part, you will learn how much heart and soul, time and commitment our employees put into their Fendt machines.

Quality is a continuous process

The development process of a new machine at Fendt begins with the virtual construction of a vehicle in Research and Development. Then a model, the so-called mock-up is built for testing. But at Fendt, the first real prototype is already built on the regular production line a few months later. Fendt employees gather their first experience in the areas of parts delivery, assembly procedures, tools, accessibility, etc. here and can incorporate these directly. This guarantees a high level of quality for the machine at the start of series production.

After you buy, we do not say goodbye to you forever

Because we accompany you and your vehicle over its entire lifecycle. Should you ever need a replacement part, AGCO Parts supplies you with high-grade components. Due to the high quality



Before the tractor body gets a complete paint job, a member of the quality staff checks all the installed parts again.



Cab quality control: After the tractor cab comes from the painting facility, the staff checks the quality of the coat of paint.

standards for in-house production and sourcing, they are especially durable, reliable and are accurate in fit. For decades. While the spare parts avail-

**»The Fendt cab is your workplace.
We check more than
60 test points with the help
of a defined check list.«**

ability in the industry is an average of 15 years, Fendt offers spare parts for technically relevant tractor parts for 20 years.

An old virtue? We find thoroughness to be very modern.

We take time for quality. At least five percent of the Fendt machines produced undergo additional, comprehensive product testing in addition to our numerous regular inspections. Our quality testers spend at least three hours checking every little detail in a comprehensive product audit of a randomly selected tractor. For example, to make sure that our high standards are maintained, a

vibration sensor measures the vibrating speed of components in the cab and the force of closing the door is measured with a force sensor.

We put everything under water to make sure everything is leak-proof.

The Fendt cab is your workplace. We check more than 60 points with the help of a defined check-list. We put every cab through a sound protection test so that you can do your work in peace. With the help of ultrasound technology, Fendt employees can find every single crack, no matter how small. Our proprietary, thorough test procedure was even adopted by a well-known Swabian automobile manufacturer. Every day three Fendt cabs undergo an intensive rain test and are checked for moisture penetration to make sure that you are not left standing in the rain. This way we comply with the high standards for commercial vehicles. And you sit high and dry.

Built with experience

Only the best employees can build the best tractors on the market. With 2.0 percent, Fendt has one of the lowest fluctuation rates in the indus-

Right: Pivoting platform in cab assembly;
Centre: height-adjustable table



Shop floor meeting at the Fendt tractor factory in Marktoberdorf

try. That means that the knowledge and experience that has been gained by employees remains at Fendt. This knowledge is passed on from generation to generation and plays a vital part in achieving above-average quality. On average, a Fendt employee is a part of the company for 15 years. During this time, they are qualified according to need. Furthermore, Fendt workplaces are designed according to the so-called "Aging Workforce" principle: e.g. they feature height-adjustable components, pivoting devices and lifting aids for heavy components. This way we can improve accessibility and create a more ergonomic workplace. Only healthy and satisfied employees can deliver the best performance and build quality for you.



Noise protection test with the aid of ultrasound technology in the cab factory in Asbach-Bäumenheim



A laser scanner tests the surface of a tractor bonnet after deep drawing in the press



Pass on knowledge.

Determine. Pass on. Act. Without delay. To permit faults to be remedied immediately, several cascading team meetings are held every day with different groups of participants. All Fendt factories hold shop floor meetings where deviations that have been detected are discussed and assigned, which then allows targeted countermeasures to be taken. The information flows from individual employees, over the team manager up to the factory management. And vice versa. Because only the fast transfer of information results in fast action. The whole thing is supported by quality further education and training as well as the AGCO University.

Precision with laser technology

To achieve the highest possible accuracy, our components are recorded and measured with the aid of a laser scanner. The results are then compared to the CAD data and a target/actual comparison is created. Our measuring technology experts recognise immediately and precisely, where the contours already fit and where they have to be corrected, before the series production parts end up in your tractor. But lasers are also used during the production process for precision checking. For example, to check the angle when chamfering the seat console or checking the surface after deep drawing the tractor bonnet. With the aid of a 5-axis laser, 3-D measurements can be created for the components.

Thinking outside of the box.

Developed together

Students, who do their internship at Fendt, also bring fresh wind and new ideas. To drive research and development forward, we cooperate with research institutes such as the Fraunhofer Institute. For example, important knowledge for future production has been gained through measurements of glass tension. The collaboration with the University of Ulm enabled us to further develop the bonding processes of the cab window panes.

You will find more information on our homepage www.fendt.com

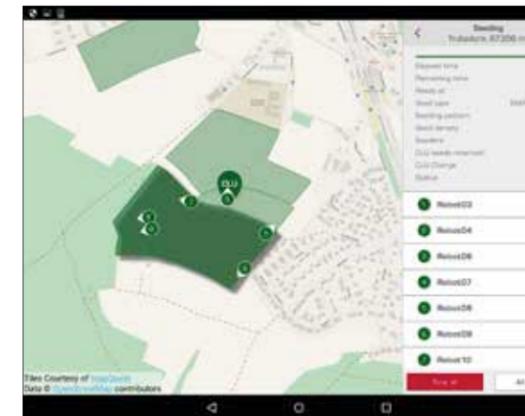


Mission to MARS – cloud-based solution for robot control

As part of the research project MARS (Mobile Agricultural Robot Swarms), Fendt has developed small robotic units that are controlled with the aid of a cloud-based solution during the sowing operation – highly precisely and independent of location.

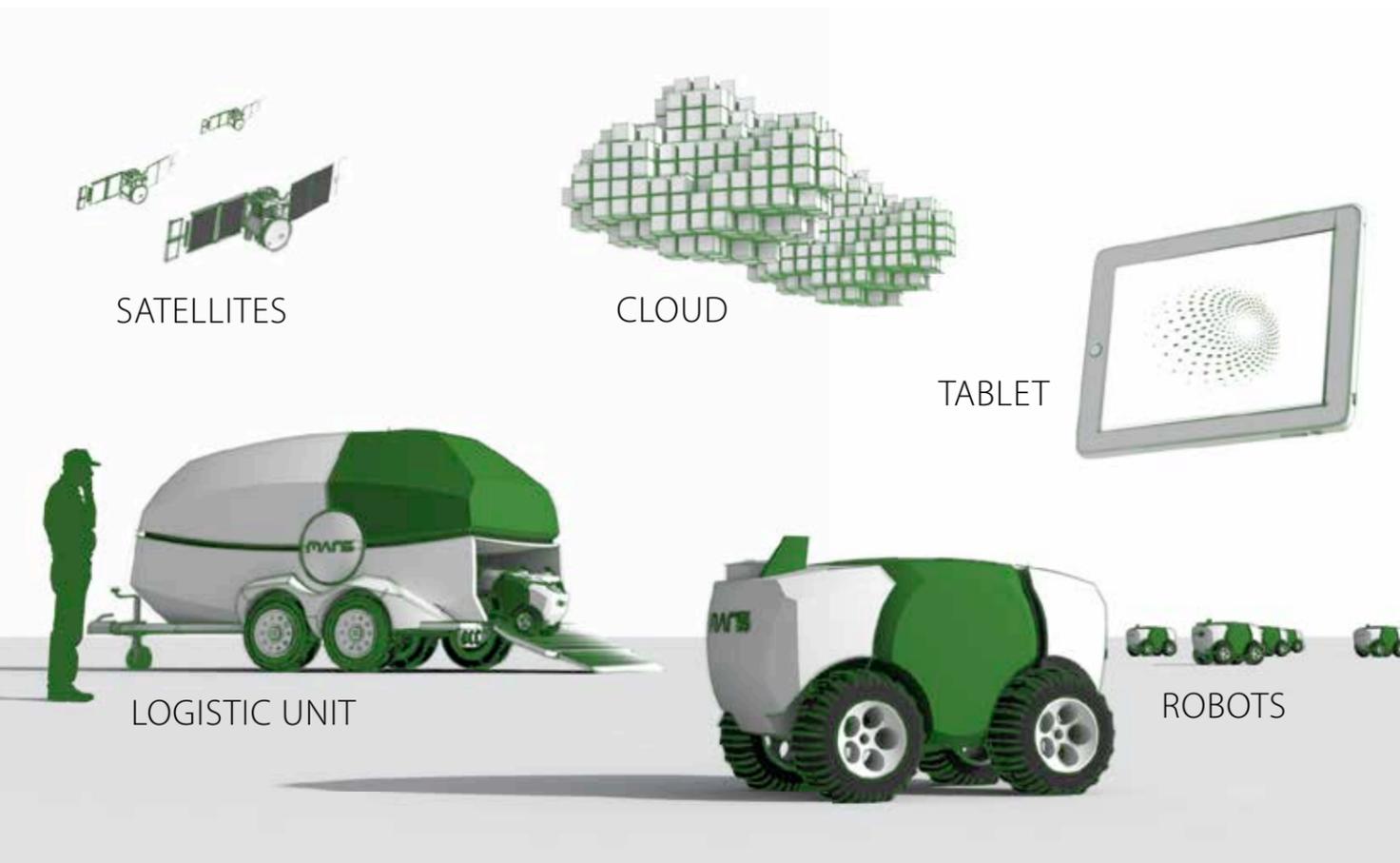
Engineers at Fendt Advance Development, together with the University of Ulm, are carrying out research on the use of autonomous robots in farming. The research project MARS (Mobile Agricultural Robot Swarms), studied satellite-supported precision seeding, e.g. for maize or sugar beets, by field robots. "There is hardly a greater challenge than providing food, energy and raw materials sustainably and economically for a growing world population," says Dr Benno Pichlmaier, Head of Research & Advance

The system can be accessed using a smart phone or tablet app.



MARS app: the location of all robots, incl. their charging state, can be viewed quickly.

Development at Fendt. "Farmers are interested in practical innovations that assist them." MARS is basically a radically simple and robust system. The field robots are transported to their operating site with a logistics unit. From there, they perform sowing operations, automatically and highly precisely, and enable site-specific adjustment of the



A concept that works everywhere: individual robots for small fields, many connected units for farming on large areas



MARS robots can, for example, go out into the fields earlier in the spring to sow seeds, where larger machines would just sink into the wet soil.



The placement of each individual seed can be documented precisely and saved in the cloud. This allows subsequent cultivation work to be executed precisely and using less resources.

sowing pattern and sowing rate as well as the exact documentation of the placement of each seed. On the one hand, this procedure supports sustainable, economic handling of food and pesticides and, on the other, offers the potential of higher yield. "Through their battery-powered, electric drive, low weight and autonomous operation, sowing can also take place under conditions where conventional farming usually cannot be used, e.g. due to light and ground conditions or noise emissions," says Thiemo Buchner, Project Manager Robotics in Advance Development.

Planning sowing operations with the MARS app
The system can be accessed using a smart phone or tablet app and can therefore be controlled independent of location. The MARS app permits easy planning of sowing operations. Using the interface, the desired field, seeds, seeding pattern and density as well as the number of robots can be selected from the available data. An intelligent algorithm (OptiVi-

»If a robot should ever fail, its task is immediately taken over by the other units.«

sor) optimises and visualises the robot operations based on the parameters that have been entered and calculates the time required to complete the task. As soon as the logistics unit has been positioned at the edge of the field, the use of the robots can be started with the app. While they are working, the robots communicate with the cloud so that the geo coordinates can be saved for the location of each seed and the progress of the operation can be followed. The OptiVisor algorithm guarantees reliable sowing of maize kernels at all times. "If a robot malfunctions, one of the other units immediately takes over its task," says Thiemo Buchner, explaining the advantages of small units. The proprietary OptiVisor algorithm monitors the charging state of the robots' batteries and ensures that all batteries are recharged at the right time at the logistics unit. Information about the placement



Easy sowing per tablet: Thiemo Buchner uses an app to work with the MARS robots.



The research project is sponsored by the European Union within the framework of the FP7 programme and is part of Echord++.

of the seed is stored in the cloud and can also be used in the further growth process for fertilisers, pesticides and harvesting. Afterwards it can be used for analysis and process optimisation. "The exact knowledge about the position of each individual seed, and consequently the later plant, that is real precision farming. Or the so-called Agriculture 4.0," says Thiemo Buchner.

You will find more information at www.fendt.tv





Crop rotation: 600 ha maize, 600 ha with soy beans, alfalfa, wheat and rye grass.

Italian clan

Whether it is a hot espresso or a creamy cappuccino – one caffeinated drink after another comes out of the coffee machine. It is five in the morning and more than 30 men are gathered together in the farmyard of the Italian agricultural enterprise “Agricola Cazzola”, holding a coffee cup in their hand.



33 permanent employees and some 30 seasonal workers are employed by the Cazzola company in a radius of 50 – 60 km.



Family-run business: The cousins Damino (l) and Paolo Cazzola manage the business. Their sisters work in the office.

It is the middle of August and harvesting time in Salizzole, an Italian community about 20 kilometres southeast of Verona. Now, primarily maize is chopped and transported 20 hours a day. The long work days begin every morning with instructions from the farm manager Paolo Cazzola and the staff for the first shift. The boss is sincere and warm towards his workers, but also decided. Paolo Cazzola



Paolo Cazzola manages the agricultural farm incl. fleet, workshop and contracting business.

is not only the boss, but also the heart of the company. He is also the first one to drive to the fields and decide whether or not maize will be chopped that day. The 31-year-old has been working on the farm, which originally was founded by his father and uncle, for 14 years already. He is responsible for the cultivation of their own 1,200 ha farm as well as 4,000 hec-

The first Fendt tractor has over 22,000 operating hours.

tares of farmland that they cultivate as contractors. “My father and my uncle started 20 years ago with some 70 hectares of land and 80 cows,” explains the young farm manager. “They both have expanded our farm over the years. When my cousin Damino and I actively joined the business, the first thing we did in 2007 was to build our first biogas facility.” Today the Cazzola farm has three biogas facilities and 500 cows in addition to their arable land. Paolo takes care of their own agricultural areas, the contracting business, the fleet and the workshop. His cousin Damino Cazzola is responsible for the dairy farm, animal husbandry as well as the biogas facilities.

Maize harvest and dairy cattle

The main plant that is cultivated in the Salizzole region is maize. The Cazzolas cultivate about



Damino Cazzola is responsible for the three biogas facilities: two with an output of up to 1 Megawatt and one with 60 Kilowatt.



At peak times, Damino Cazzola's cows produce up to 5 tonnes of milk a day.

600 hectares of their farmland with maize, which is then used for biogas and fodder for the cows. "The results that we achieve on the field are decisive for the optimal conversion in our end products," says Damino Cazzola, describing the work his cousin Paolo and his employees do. "That means: The healthier the plant is, the higher the quality of the milk from our cows and the higher the energy production will be."

The year 2016 was a very good year for maize, according to Paolo. He drives his white pick-up truck on the fields for several hours every day to check and coordinate the work. At two in the afternoon, the first shift is finished work and the second group begins to work until midnight. "During this high-pressure time, we even have a team of mechanics at night for the maintenance and repair of the

»Each machine works an average of 2,000 hours a year.«

machines," says Paolo, describing the planned processes. Because they can hardly afford downtimes, the Cazzola company relies on Fendt. Four forage harvesters, the last one is a Katana 65 and a Katana 85, as well as 30 Fendt tractors take over diverse work. "We use the high-horsepower tractors for heavy work, from deep tillage to storing the silage in the clamp silos," says Paolo, describing the Fendt tractor operations. "We mainly use the mid-sized tractors for transport work with trailers or tankers or for medium-deep cultivation, such as tillage, harrowing or soil loosening. We use the smaller tractors for harvesting hay and sowing. Each machine works an average of 2,000 hours a year. We have several that already have more than 20,000 hours on them." They only discovered the Fendt brand by accident. "In August 2003, we urgently needed a tractor, because our previous tractor stopped working during work in the field. The only tractor that could be delivered quickly was a Fendt 712 Vario. We tried it and quickly

discovered that we had a first-class machine. First we bought one each year, then more and more, until we had 30-32 machines." The first 712 Vario is still at work on the farm. "It now has more than 22,000 work hours and we want to keep it as a collector's item," laughs Paolo.

The next seed is already planted

It is now evening and Paolo Cazzola is still working. A brief siesta and a double espresso do a good job of making him alert again. After all, he wants to inspect his employees' work for the day and which fields can be worked by the early shift. "We are currently expanding rapidly. Our business has increased turnover and business volume every year. The cultivated areas are increasing, and with it the work. This is where Fendt is a help. Admittedly, if you compare prices, Fendt tractors cost more. But in the long term, the substantial investment pays off. We do not have any long downtimes and have an outstanding relationship with our Fendt dealer Agri-Verde s.r.l. from Verona."

Paolo Cazzola grew into his parents' business as a matter of course. Together with his cousin Damiano, he is now responsible for the Cazzola company, the employees and also the customers. Paolo's little son already sits in the pick-up beside his Dad and drives over the fields. The seed for the next generation of the family-run Cazzola business has already been planted.



The Fendt Katana 65 manages over 1000 hectares of maize per season and is only operated by two drivers: father and son.



You will find more photos and information at www.fendt.tv



The perfect silage with Fendt.



Everyone is talking about the topic of chop quality due to the current discussion about the so-called long cut (see box). In the meantime, it has become apparent that the quality of the chopped material is much more important and, most of all, that the right processing plays a central role. On the Fendt Katana forage harvester, all components have therefore been designed for the best chopping results – from the header to the cutterhead to the cracker.



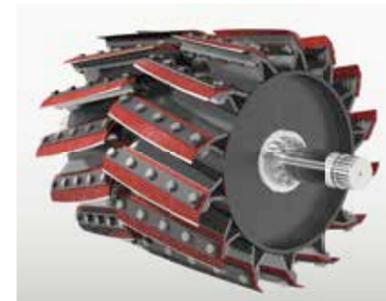
To begin with, a uniform and turbulence-free crop flow is decisive for optimal silage results. Fendt offers a large selection of pick-up and mower headers for this, which means the right header is available for every operation. The low-wear headers are fast and easy to change and are very maintenance-friendly.

Only with homogeneous chopped material can optimal compression be achieved in the silo, which, in turn, enables good silage quality.

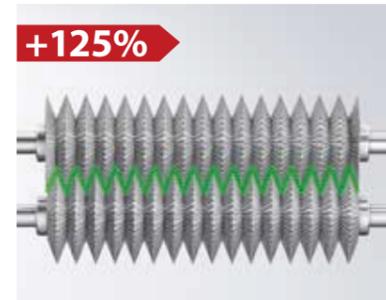
The continuously variable header speed, adapted to the forward speed of the forage harvester, means the crop flow is especially uniform. Attached to the header is a swinging frame, which swings actively via three rollers and a cylinder above the frame and adapts itself to the position of the header. To ensure that the chopped material also arrives uniformly at the feed rollers, the pivot point of the system is in the centre of the intake. This means the cross-section



The greatest possible compression of the cut material thanks to 6 feed rollers, pre-tensioned with large-dimensioned spring assemblies.



Enormous cutting frequency for higher output, with the largest cutterhead on the market



Perfect kernel processing with the Fendt V-Cracker

remains nearly the same, even when the frame is swinging. The material is fed efficiently to the cutterhead by six hydraulically driven feed rollers. Pre-tensioning through large-sized spring pack guarantees high pre-compression and therefore a more exact cut.

Enormous cutting frequency with the large cutterhead

For perfect silage, the desired chop length should be constant and without overlengths, for every crop and under all harvesting conditions. Because only with homogeneous chopped material can optimal compression be achieved in the silo, which, in turn, enables good silage quality. The large cutterhead has a 720-mm diameter and its knives have an especially high cutting frequency of up to 23,000 cuts per minute. In combination with the v-shaped arrangement of the 20, 28 or 40 knives, you can achieve excellent chop quality at all times with cutting lengths from 2.6 – 42 mm – even with a high throughput. For maize silage in particular, at least 95 percent of all kernels must be cracked for optimal digestibility – independent of the chop length. To make enough starch available, two thirds of the maize kernels must



THE LONG CUT

What is the current discussion regarding chop lengths for maize, i.e. the so-called long cut, and for the brand term "Shredlage", all about?

The topic, which applies mainly to dairy farms, comes from the USA and is only a peripheral phenomenon. There one is looking for other solutions for adding more structure in the fodder rations, because crude fibre, such as straw or hay, are lacking. With cutting lengths of over 20 mm in combination with kernels cracked into multiple fractions and the lengthwise split fibre, the proponents primarily hope for more effective fibre in the staple feed.

This is meant to increase the feed uptake and promote digestibility, with the aim of increasing milk output. A current fodder study of the Chamber of Agriculture Westphalia, however, shows that the milk output cannot be increased through this method and enormous extra costs are involved. These result from the necessary investment costs and higher transport and wear costs as well as losses because the silage is not compressed. This study as well as numerous other worldwide studies conclude that not the chop length, but rather good kernel processing determines the chop quality.

be cracked into at least three parts. Also decisive for the quality is that the rachis is split into at least eight parts. No problem for the Fendt V-Cracker: its special design ensures excellent processing of the chopped material and optimal kernel processing. Through the use of rollers fitted with corrugated discs, the cracking length of the cracker is more than twice as long as on conventional rollers. Longer contact with the discs results in lengthwise splitting of the crop. Furthermore, since the discs mesh, the speeds on the inside and outside of the disc are different. This results in highly efficient and thorough cracking of the maize kernels. You can achieve excellent chop quality with the Fendt Katana, not only your cows will be highly satisfied with it.

Stepless in a new generation

FOR THE 20TH BIRTHDAY OF THE VARIO TRANSMISSION



Not fuel, but rather hydraulic oil flows through the veins of a Fendt tractor, jokes the Fendt team. Indeed, it is the ingenious Vario transmission, the heart of every green tractor from Marktoberdorf, that makes the difference: unbeatable in efficiency, dynamics and ride comfort to this day. Vario – that stands for stepless driving and has already convinced 250,000 customers around the world.



Anniversary for a successful model

When the 250,000th Fendt Vario transmission leaves the production halls in Marktoberdorf these days, not only the Fendt employees will be lighting a birthday candle. Now, a good twenty years since the introduction of the first tractor with stepless Vario transmission, a quarter of a million have been sold.

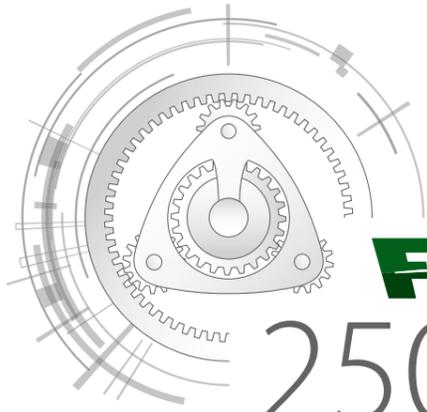
A lot of luck

The transmission developer, Richard Heindl, also thinks it is a good reason to celebrate. The engineer believed in the success of this variable drive from the very beginning. It makes shifting unnecessary and facilitates farmers' work. Heindl's professional life would not be imaginable without transmission design. The engineer laughs: "I was lucky to be able to work more than 30 years on the development and updating of the Vario idea." Today, colleagues build on the experience that the transmission expert has gathered over the years. Richard Heindl recalls how

ANNIVERSARY PROMOTION

250,000 Vario transmissions – that also means a lot of convinced customers, who rely on the power, dynamics and ride comfort of the stepless transmission. For the anniversary, Fendt would like to express its thanks by bringing 250 tractors from the 500, 700, 800 and 900 Vario model ranges onto the market in the colour Fendt nature Green and the special Design Line version as part of a special promotion.

A Vario transmission is built into every Fendt tractor. The 250,000th stepless transmission was built into a vehicle in November 2016. Anniversary for a successful model!



FENDT

250.000 VARIO



The 100,000th Vario transmission is the heart of this gold Fendt 211 Vario, built in 2009. Since then, every Fendt tractor, from the largest to the smallest, is stepless.

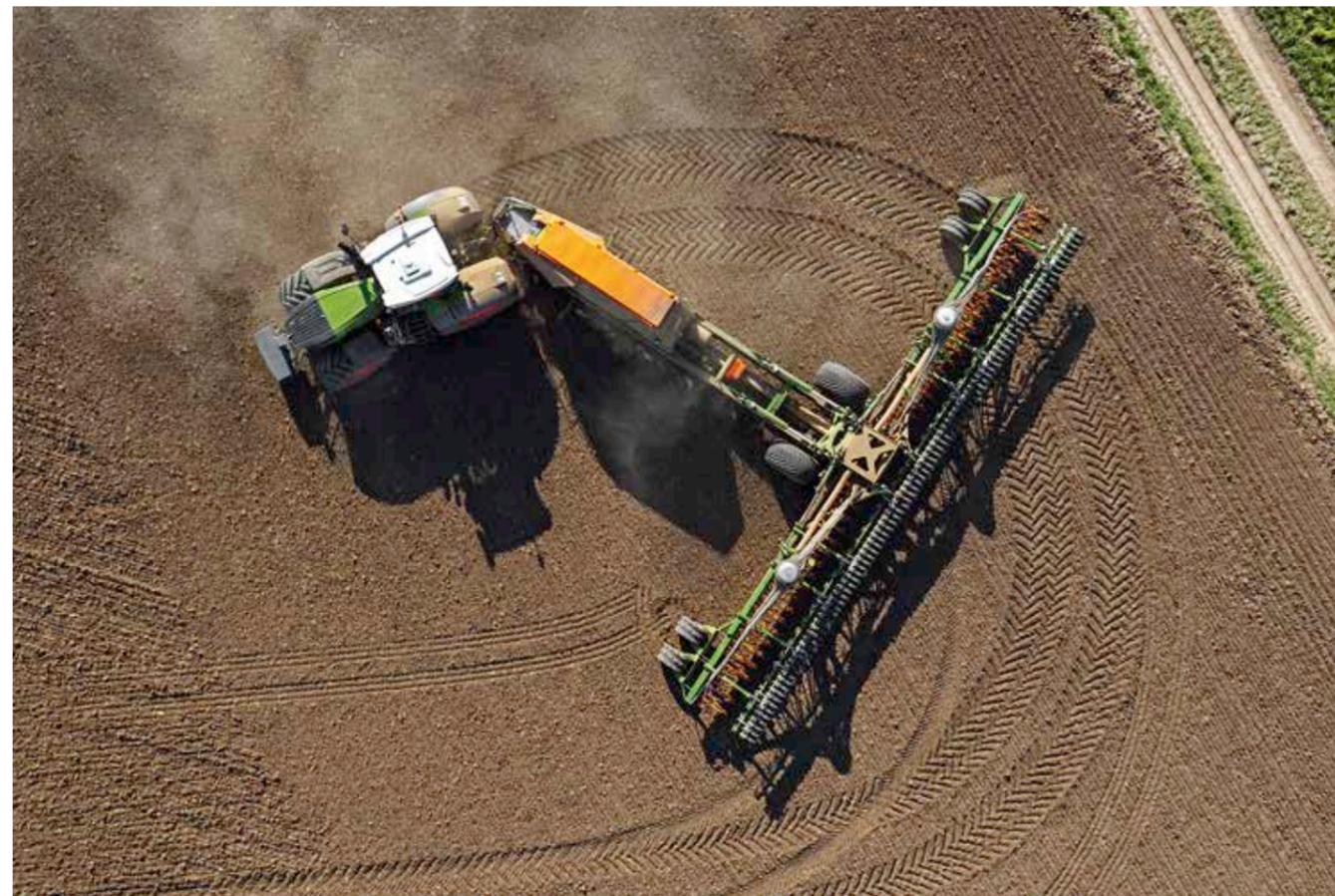
he started as a new member in Hans Marschall's development team in the mid-80's. Hans Marschall, who died in 1989, was considered the mastermind of the stepless, hydrostatic power-split transmission. "All of the following developments were based on his basic idea," explains Heindl, who had his workplace diagonally opposite from Marschall's desk at that time. "We all did pioneer work at Fendt."

Fascinating idea

The reservations were high and the market environment was shaken by crises. Despite this, Fendt invested in an innovation that was both forward-

»I was fascinated by the idea of a tractor that can be driven without shifting, jerking or interruptions in power.«

looking as well as complex. There were many challenges for the Fendt transmission developer: At the beginning of the 1990's, vehicle electronics were still in their infancy, however, it was clear that controlling and operating would no longer be mechanically, but rather electronically-controlled, in the future. The classic shift lever would soon be obsolete. The well-



It was the first tractor in the world with a stepless, variable drive: the Fendt Favorit 926 Vario from 1995. The invention revolutionised agricultural engineering.

known, user-friendly multifunction joystick slowly took its place. Another problem was the sound, because the oil pumps simply made too much noise. "We developed a concept for elastic bearings and therefore for the sound isolation of the pumps," says Heindl, looking back. He, as well as many other engineers, had a clear goal in mind: "I have a farming background and was fascinated by the idea of a tractor that can be driven without shifting, jerking or interruptions in power – no matter what speed, whether uphill or downhill, whether forward or reverse. The tractor operator should concentrate on what is really important: his work in the fields and on arable land." Especially today, where automated driving has become reality, Fendt customers have confirmed the enormous advantages of the stepless drive one hundred thousand times.



The Fendt 1000 Vario high-horsepower tractor with VarioDrive sets itself apart with its permanent four-wheel drive function, enhanced tractive power and high manoeuvrability.

A development that was not foreseeable? A development that was not foreseeable in this form? "The project was kept secret for a long time. We were very proud to finally present the first stepless transmission to the public. Because it was clear to us: This will revolutionise agricultural engineering."

"Revolution in transmission design"
Hanover, Agritechnica 1995: The sensation was perfect, when Fendt, as the first tractor manufacturer worldwide, presented the stepless, power-split ground drive in its flagship, the Fendt 926 Vario, at the international agricultural machinery trade fair. A

The Vario transmission models are designated "ML" for "Marschall leistungsverzweigt" (Marschall power-split) to honour the mastermind, Fendt engineer Hans Marschall. The first continuously variable transmission model ML 200, which was used in the Fendt 926 Vario in 1995.

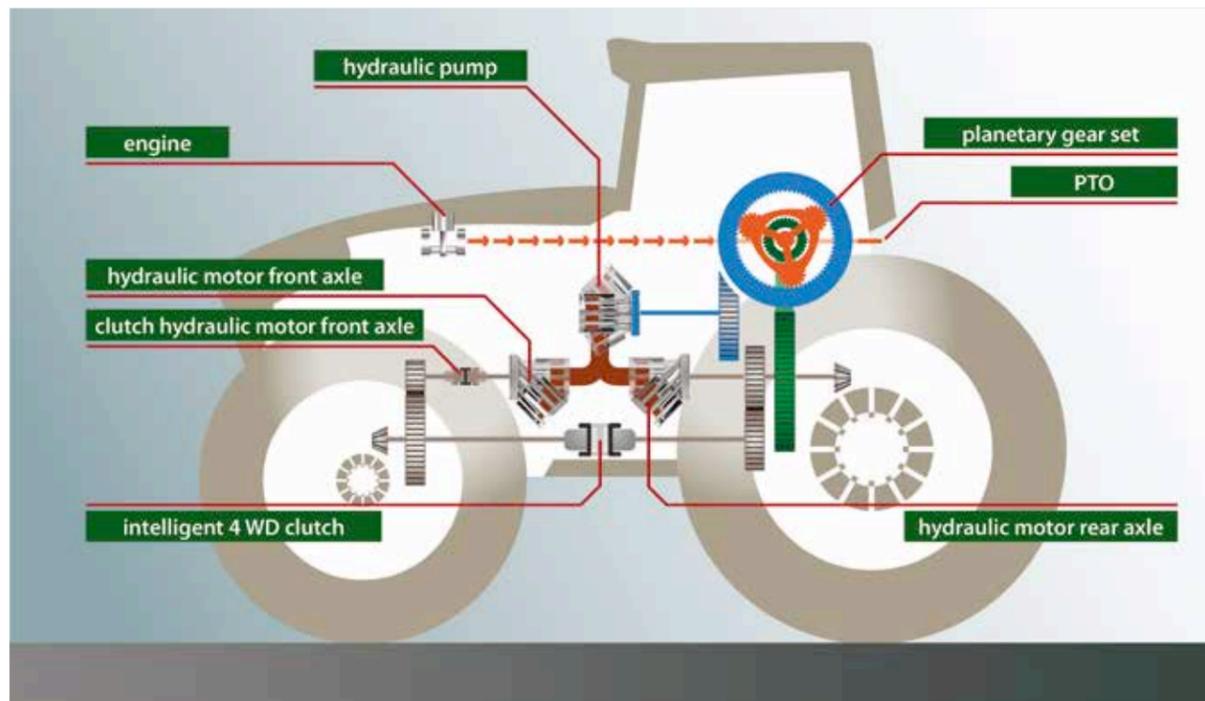


"Revolution in transmission design", was the verdict of the editors and testers at profi magazine. "Technically years ahead" and "a new yardstick in tractor design" confirmed Professor K. Th. Renius from the Technical University Munich. The development of the Vario transmission, as the variable ground drive was called from then on, was not only a huge hit with the experts, but also, in particular, with users, farmers, contractors and farm managers. The demand was so high that every series,

»Revolution in transmission design«, was the verdict of the editors and testers at profi magazine.

from the 200er to the 900er model, has been fitted with a Vario drive since 2009. And the success story continues: with the further development of the Fendt VarioDrive drive train, the second Vario generation, another "revolution" lies waiting under the bonnet of the most power Fendt tractor, the Fendt 1000 Vario.

Dare to do something new
The presentation of the 1000er series at the Agritechnica 2015 – exactly twenty years ago after the birth of the first Fendt Vario tractor – heralded the start of the next Vario transmission generation. Fendt VarioDrive is the name of the completely newly developed transmission, which, thanks to an independent



Agritechnica 2015: The Fendt 1000 Vario with the new Fendt VarioDrive drive train wins all awards: Tractor of the Year, Machine of the Year, DLG Silver Medal.

drive of the axles, provides a continual variable four-wheel drive function – automatically, without requiring operator intervention. New is that both the rear as well as front axle have their own hydraulic motor. Richard Heindl played a leading role in the development of the Fendt VarioDrive drive train. In 2006, he was asked to make a proposal for a transmission that is no bigger than that of the 900 series, but delivers at least half as much power more. It is about nothing less than to dare to do something completely different again and to be the pioneer of a future tractor generation. "We stood before great challenges once again," says Heindl, looking back. "The space under the cab was already completely used, the power limits of the conventional Vario transmission as well. We therefore had to further develop the original design concept from the ground up, but without touching

The schematic clearly shows how the VarioDrive works. New is that both the rear as well as front axle have their own hydraulic motor.

250,000 TRANSMISSIONS IN 20 YEARS

That is currently: some 100 transmissions a day, produced in **two** shifts by **880** employees in the transmission factory.

Every **six** minutes, a transmission leaves the assembly line, which was assembled with a **five-hour** lead time and tested on **four** transmission test benches.

100 percent quality



Undergoing thorough testing: a Vario transmission in the enclosed testing booth. Afterwards only 100 percent quality is built into the tractor.

the core functions." A completely new arrangement of the components allowed the gears and hydraulic motors to be enlarged within nearly the same amount of space. Their hydraulic power was distributed to the front and rear axle drive and resulted in a completely new type of four-wheel function. The intelligent torque distribution ensures constant traction, even when cornering. The front wheel drive is in the position to pull the tractor through the curve actively when turning. Better manoeuvrability, higher tractive power and lower consumption – the recipe for the success of the new Fendt VarioDrive has already been put together. Now it is time to expand the concept horizontally. "I am convinced that the VarioDrive will be the drive for the upcoming decades," says Richard Heindl, representing the team, which now has many new and enthusiastic young colleagues.

Tough quality control

A change in scene: In the transmission factory, not far from Heindl's office, a three-tonne VarioDrive transmission with rear axle is just leaving the assembly line. It is waiting for its first tough test: in high-tech test bench no. 4, a tough half-an-hour continuous endurance test is waiting. All working situations, which a tractor could encounter, are simulated to thoroughly check functions, components and processes in the transmission. Everything runs automatically, equipped with the latest measuring systems. Calibration, high-pressure testing up to 550 bar, maximum speed, etc. The closed testing booth seems like an operating room: the transmission and measuring devices are working very precisely at full speed. "The transmission is only built into a tractor if all of its functions are 100 percent in order," explains Florian Wagenseil, Head of Fendt Transmission Assembly. The endurance test is the last module of a comprehensive quality control procedure in the transmis-



"We all want the best quality," says Karl-Heinz Welz about his team. The new VarioDrive in the Fendt 1000 Vario is also built in the transmission factory in Marktoberdorf.

sion factory, as Wagenseil describes it. Every component, every assembly, undergoes a test with micrometre accuracy: automated, per visual inspection or particle monitoring, and, last but not least, by the staff themselves. "We measure the accuracy of the manufactured parts in μm (" μ " = 1/1000mm)," says Wagenseil.

Passion for a Meisterwerk

The fascination of a successful Vario model cannot be completely described by measured figures. Who is responsible for breathing life, power and passion into each and every Fendt tractor? This question is best addressed to Karl-Heinz Welz, the head of the transmission factory: "That would be the 880 Fendt

employees, who are involved in the production of the transmission in Marktoberdorf and who devote their whole passion to a Meisterwerk," says Welz with conviction. He is a Fendt institution and has devoted himself to the tractors from the Allgäu for 46 years now. If asked about the hidden qualities of transmission production, one can experience him as a passionate advocator of his team. The ideas and suggestions for improvement that come from the team are very important to him. "These are my pros, who know what they need," says the boss of the transmission factory and laughs. For example, an assembly wagon for the assembly line was developed in this way. It ensures ergonomic conditions at the assembly workplaces. And the latest test bench, which is reserved for the Fendt VarioDrive, was also set up together with employees to meet the needs of Fendt transmission production. Welz is convinced that motivated employees are the best quality control.

The Fendt spirit flows through the Vario transmission

The modern and continually improved manufacturing and assembly line, which brings some 100 Vario transmissions to life every day, also shows that Karl-

»We make the Fendt spirit visible!«

Heinz Welz and his team does not just rest on the experience of past years. Welz is proud of his team, which has mastered the series production of the complex drive train on the Fendt 1000 Vario from the very first day. "Every employee that touches the transmission, ignites the fire of a Fendt tractor. We make the Fendt spirit visible." Because Fendt relies exclusively on in-house expertise in transmission design and the unrivalled experience gained in the series production of continuously variable transmissions. Every component of the transmission, gears, shafts and housings are manufactured from the many tonnes of steel that are delivered to Fendt every day. From manufacturing to assembly, all the processes are bundled in one department. "Everything here is set up for one-hundred percent quality," confirms assembly manager Wagenseil. "After all, we want to earn the trust, which we receive by the hundreds, each and every day."

Find out more about the Fendt VarioDrive at www.Fendt.TV



New combine model for slopes

The Fendt full-line also features harvesting machines, including combines, balers, forage harvesting machinery and the Katana forage harvester model. A new model for the Fendt C-Series combines will be introduced for the 2017 harvest.



Enhanced performance through the PowerFlow table with up to 7.70 cutting width.

With the Fendt 6335 C ParaLevel Integrale (PLI), Fendt expands its line of combines for steep slopes. The well-known ParaLevel system enables side-to-side slope compensation of up to 20 percent, while the Integral system levels fore-to-aft tilt using the rear axle. "It compensates for slopes of up to 30 percent when driving uphill and up to 10 percent when driving downhill," says Gert Albert, Product Engineer for Fendt Harvesting, explaining the advantages of the new model. "With the combination of the ParaLevel and Integral systems, the machine is kept completely level, even on steep slopes. This balances out the crop flow in the threshing unit, on the straw walkers and in the shaker shoe and optimises grain and threshing quality." The Fendt combine can also

The Fendt VarioGuide automated steering system as well as the Fendt VarioDoc Pro documentation system is available as an option for the big Varioterminal.

call up the installed machine power on slopes as well as guarantee high productivity. The four-wheel drive of the Fendt 6335 C PLI ensures ideal traction and therefore greater safety in hilly terrain.

Intuitive control through new Variotronic terminal generation

The 7-B and 10.4-B Varioterminals in smartphone look, familiar from the tractors, are now also available in the "Proline" and "Skyline" combine cabs. They are marked by intuitive operation through the combined use of touch and key control elements. Thanks to a new bracket with ball joint, the Varioterminals can be adjusted flexibly. They have a clear resolution with LED backlighting and a scratch-proof, one-piece glass surface that is easy to clean. In the Varioterminal 7-B, in addition to controlling the machine func-

tions, it is also possible to save settings for all major types of crops and control the diagnostics functions. The Varioterminal 7-B is available in the Proline cab. "The Varioterminal 10.4-B additionally offers two camera ports and can be upgraded with the Fendt VarioGuide guidance system and Fendt VarioDoc Pro documentation system," says Gert Albert, explaining the optionally available systems. The combines in the C, P and X-Series have the Varioterminal 10.4-B as standard specification in the Skyline cab.

New table guidance for improved threshing performance

All machines in the C, L, P and X-Series now have TerraControl II™ table guidance as standard specification.

TerraControl II™ allows the selection of three different cutting heights, for clean crop pick-up and feed, even in difficult harvesting conditions. The side-to-side table guidance compensates for uneven ground up to eight percent. In addition, TerraControl II™ table guidance also includes field pressure control, which guarantees that the table is guided directly above the ground when harvesting laid crops.

Increase in threshing performance with the throughput control system Constant Flow

The Constant Flow throughput control system automatically adapts the driving speed of the combine to the density of the crop. Two sensors in the threshing unit drive determine the load on the machine, so that the load on the threshing unit can be kept as close to optimum as possible. The throughput control system is standard in the P and X-Series.

Harvest, where others spend their holidays

Rügen records nearly six million overnight stays every year. The landscape on the island is very multi-faceted. Next to tourism, agriculture plays a major role on the largest German island. The favourable climate conditions, fertile soil and large area structures are ideal for arable farming. Some 65,000 hectares of agricultural land is available on the island, three quarters are used for growing cereals. Animal husbandry has declined rapidly in the past years. About 40 farms have more than 100 hectares. 15 farms even have more than 2,000 hectares. In particular, in the middle and northern parts of the island, individual fields can cover over 150 hectares.



Karsten Koldewitz with his Fendt 9490X and the Baltic Sea bay in front of Gross Stresow in the background



Mario Otto with his new Fendt 5255L

The mixed farming enterprise belonging to Mario Otto is located in the southern part of the island, near the village of Poseritz. Besides dairy farming, the family-run farm cultivates 180 hectares of cereals. For the harvest 2016, the farm invested in a new Fendt 5255 L straw walker combine. Farm manager

»The thresher also does a super job with specialty crops such as lupines and peas.«

Mario Otto has been driving combines for 16 years and even today, he mostly sits in the cab himself. "We chose the L-Series from Fendt because we already had good experience with the threshing system. Besides the excellent threshing performance, the quality of the straw is important to us, because we use it in the stable as bedding for our animals. The



Mario Otto in front of his 5255L after completing the harvest



6.20-metre PowerFlow table has really proven itself on our fields under difficult conditions when harvesting peas and lupines," reports Mario Otto. Especially important for the agricultural enterprise is operational reliability, because on Rügen there are no harvesting services offered by contractors. Nearly all the farms own all of their own machinery for harvesting, cultivation, drilling and applying pesticides.

Straw distribution over the whole width

The Lauterbach farming enterprise is located on the southern coast of Rügen near the seaside resort of Putbus. Two combines are used for threshing, one of them is the Fendt hybrid combine 9490 X. Long-standing employee Karsten Koldewitz has already harvested more than 10,000 hectares for the Lauterbach farm. He is just the right person to thoroughly test the currently strongest Fendt combine in its first season on the farm. "The 9490 X is to thresh 500 hectares of cereals in the summer," explains Karsten. The 496-hp combine is equipped with a 10.70-metre wide PowerFlow table. The knives are driven from both sides and the intake auger has a large diameter, measuring 762 millimetres. The table is optimally designed for harvesting high-volume locations, such as Rügen. After all, it is nothing unusual to harvest 100 decitonnes or more of wheat per hectare on the island. Barley is often harvested with more than 80 decitonnes per hectare. The yields for rapeseed lies at an average of 50 dt/ha. These are the most important crops on the island. The X-Series is well prepared for the larger quantities of straw, which are

Mario Otto threshes the last hectares of the season



Raiffeisen Technik Nord-Ost, Teschenhagen location

harvested on the fields of grain on Rügen. The straw chopper has 8 rows with a total of 108 serrated blades and has a considerably higher working speed than standard straw choppers. The two discs or the radial spreader ensure uniform spreading of the chopped material over the entire working width.

Tracks for optimum soil protection

Furthermore, the farm manager has decided to fit it with the ATRAK crawler track. This maximises the contact area through four suspended midwheels and the 63.5 centimetre wide crawler tracks, which contributes to smoother running and, of course, protects the soil.

Daniel Wolf is a factory representative for Fendt and also responsible for dealer and customer support on Rügen. Wolf was born on the island and is very familiar with the local farms and their development. "Between six and ten combines from all brands are

»The performance of our harvesting machines is impressive and we have a good dealer here on the island.«

sold on Rügen each year. We are proud to have sold three Fendt combines this season," reports Daniel Wolf. And it also looks good for the upcoming season: "The performance of our harvesting machines is impressive and we have a good dealer here on the island. The word gets around," says Wolf.



Harvesting team on Rügen: Daniel Wolf, Fendt Harvesting and Frank-Carsten Kapke from the Raiffeisen Technik Nord-Ost GmbH on Rügen



Ilona Wolff, Managing Director of the Agrarprodukte Garz GmbH

Reliable partner on Rügen

The Raiffeisen Technik Nord-Ost GmbH took over the sales for Fendt harvesting machinery and tractor two years ago. Besides the three branches on the mainland, the dealer also has a location with a workshop on Rügen. "The colleagues in Service have visited numerous training courses to be well-prepared to provide support to harvesting machinery customers. They did fantastic work this summer," says Frank-Carsten Kapke, who is in the sales force for the Raiffeisen Technik Nord-Ost GmbH on Rügen. "Due to the large harvesting volumes, there are hardly any combines older than ten years. At the same time, the expectations for the machines are very high. Replacement of parts and any necessary repairs must be done immediately. "The personal contact to customers still has great significance on the island,"



ing concept is very similar to that of the combines. For example, setting and operating the VarioGuide automated steering system is practically identical. It is very important to us that the operators can work well with the machines and they feel good in the cab, that is why the employees are involved in purchasing new machines from the very beginning," explains Ilona Wolff.

Agricultural production on Rügen is exciting and in many ways unique in Germany. While some people come to relax on the Baltic Sea island in the summer months, the farmers and agricultural cooperatives make use of the dry days for harvesting. And both is possible at the same time on Germany's biggest island.



reports Frank-Carsten Kapke. He also maintains contact with the agricultural company Agrarprodukte Garz. Ilona Wolff is the managing director. She studied farming and has been working in the business since 1979 and knows what is important for harvesting: "The climate conditions, especially the rainfall on Rügen, are a gift, however they are also a great challenge when organising harvesting machines. We have optimal growth conditions over the entire year, thanks to the morning dew, which moves over the island from the Baltic Sea. The combines therefore

»We want to thresh
100 hectares a day.«

have fewer hours of operation in the day than in other regions of Germany. Usually we can only go onto the field after noon and have to stop harvesting operations before ten in the evening due to the moisture. We calculate an average of 23 harvesting days for our 1,400 hectares. In ideal cases, we can harvest 100 hectares a day with our three combines. The latest and best technology is important to ensure operational reliability. For every hour that a combine stands still, we lose three hectares of harvesting," explains Ilona Wolff. In the first season, the team in Garz used the Fendt 9490 X. "Our operators quickly managed the Fendt combine, after all, we also have Fendt tractors in our fleet and their operat-



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- Latest VarioGuide guidance system with flexible choice of receivers
- New terminal generation
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- New Fendt standard colour - 'Nature Green'

512 Vario	125 hp*	92 kW*
513 Vario	135 hp*	99 kW*
514 Vario	150 hp*	110 kW*
516 Vario	165 hp*	121 kW*

* Maximum output to ECE R24