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AGRITECHNICA 2022 with the Precision Team

**AMAZONE****SCHMOTZER** 

Contents

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	Page		Page
Innovations in soil tillage		Innovations in crop protection technology	
‣ Tyrok 400 semi-mounted reversible plough	8	‣ SCHMOTZER Venterra 2K hoe	64
‣ Teres 300 mounted reversible plough	14	‣ FT-P 1502 self-contained front tank	66
‣ Cobra-2TX trailed shallow cultivator	20	‣ UX SmartSprayer joint project	70
‣ Ceus-TX disc & tine- combination cultivator	24	‣ UX 7601 Super and UX 8601	
‣ C-Mix Ultra tine system	28	Super trailed sprayers	74
‣ HD goose foot share	30	‣ Super-L3 boom from 39 m to 42 m	78
‣ X-Cutter disc	32	‣ DirectInject direct feed system	82
‣ Project: TopCut tool carrier	36	‣ Pantera 4504-HW self-propelled sprayer	
‣ KE 02 Rotamix rotary harrow	40	with Comfort-Pack plus	86
Innovations in sowing technology		Innovations in electronics	
‣ TwinTeC Special double disc coulters	46	‣ Certified camera system	92
‣ Mounted combination: Precea precision air seeder		Innovations in robotics	
with CombiDisc 3000 compact disc harrow	48	‣ Autonomous agricultural machinery, precision	
‣ Hydraulic tramline offset for Precea		technologies and Controlled Row Farming	98
precision air seeder	50	Innovations in Groundcare/winter road gritting	
‣ SmartForce automatic coulter force regulation for		‣ IceTiger	106
Precea Super precision air seeders	52		
‣ Knife roller as a front tool on the Cirrus 6003-2	54		
Innovations in fertilising technology			
‣ WindControl independent of ArgusTwin	60		



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Contact:

Dorina Hüggenberg, AMAZONE Marketing and Communication
 E-Mail: Dorina.Hueggenberg@amazone.de
 Tel: +49 (0)5405 501-7110

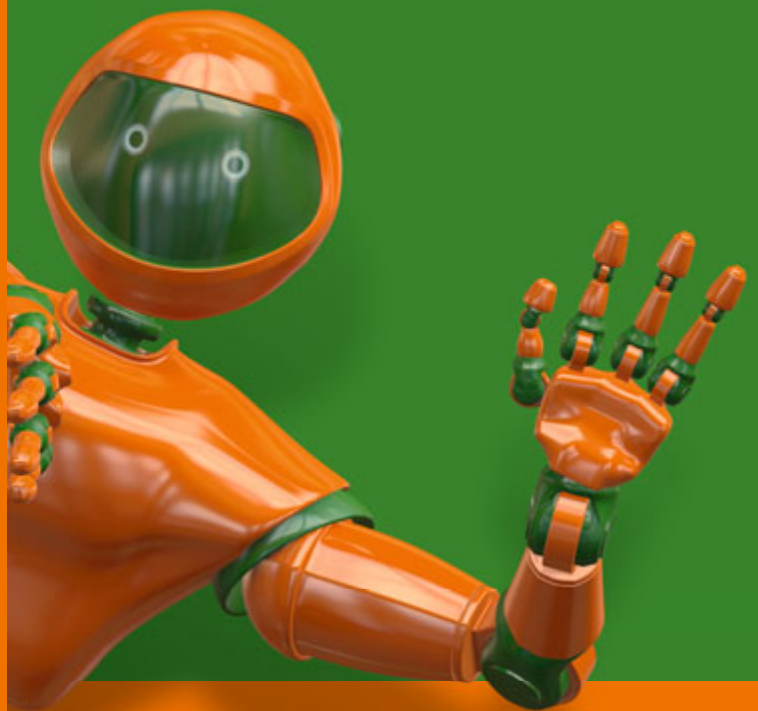
Dirk Brömstrup, AMAZONE Marketing and Communication
 E-Mail: Dirk.Broemstrup@amazone.de
 Tel: +49 (0)5405 501-116



AMAZONE trials area at Wambergen

GO

green orange



**Innovations in
soil tillage**

Tyrok 400 semi-mounted reversible plough

New flagship in the plough range –
higher speed for higher output with minimum wear



The new AMAZONE Tyrok 400 semi-mounted reversible plough generates an optimum working profile at speeds of 8 to 10 km/h due to its extremely high robustness and state-of-the-art SpeedBlade plough body concept

Video of Tyrok 400 in use:
www.amazone.net/yt-tyrok-400





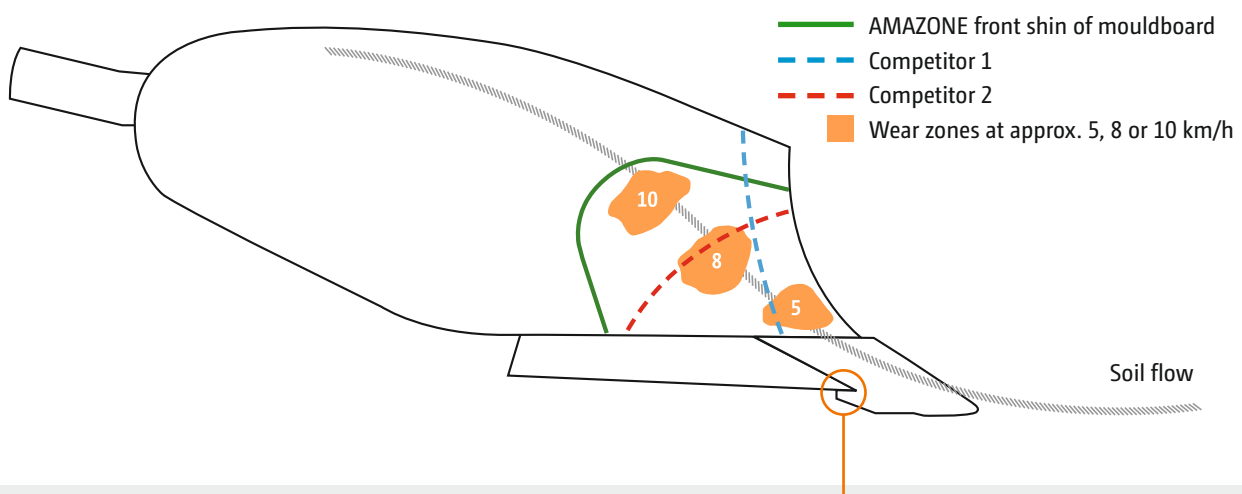
The new Tyrok 400 VS with packer

With the Tyrok 400, AMAZONE now launches a completely new semi-mounted reversible plough in a choice of seven, eight, or nine furrows for the 400 HP tractor class. The main features of this plough are its higher output, even under continuous load, perfect quality of work and outstanding robustness. At the same time, the Tyrok offers a high level of comfort thanks to its very simple, reliable and exact adjustability.

Plough bodies meticulously thought-through – SpeedBlade for improved performance

The new **SpeedBlade** plough body, with its patented extra-large front shin on the mouldboard, makes for minimal wear on the main mouldboard. The main wear point automatically shifts further and further back towards the centre of the plough body as the working speed increases from say 6 km/h up to 10 km/h. As a result, the main wear point of the SpeedBlade plough body is kept on the enlarged front shin of the mouldboard and not back on the main part of

SpeedBlade body with patented AMAZONE mouldboard front shin



SpeedBlade body U 40

Point covers the wing:

- ✓ The joint sits protected by the point
- ✓ Plant residues, baler twine, wire and root residues cannot get entangled



SpeedBlade plough body with its extra-large front shin on the mouldboard. The point covers the wing, meaning that the joint is protected by the point.

the slatted or solid mouldboard, even at these higher forward speeds, meaning, therefore, that only the front shin of the mouldboard needs to be replaced initially on the Tyrok when used at higher speeds. This enormously reduces wearing costs compared to other designs.

Another detail with great effect: the point covers the wing, meaning that the joint is protected by the point. Thanks to this clever join up, no plant residues or baler twine can get entangled. In addition, the open frog prevents soil from sticking under the frog due to its profile so that the maximum ease of pull on the plough body is maintained.

The unique **©plus hardening process** provides the basis for high quality during the manufacture of Tyrok wear parts and is a result of the additional introduction of carbon. For example, a very high hardness and thereby a smooth surface is achieved on the front of the mouldboard which ensures a long service life for the wear parts. The reverse side remains, however, relatively soft and is therefore extremely tough and impact resistant.

The SpeedBlade plough body range offers a selection of different slatted and solid mouldboard profiles, depending on the application and the objective. The sophisticated design of the plough bodies combined with the advantages of the ©plus hardening process ensure a low pulling power requirement, thereby reducing fuel consumption.



Wide furrow clearance on Tyrok 400

For particularly tough conditions, the points are also available as an HD option or as reversible, interchangeable points for short set-up times and less wear.

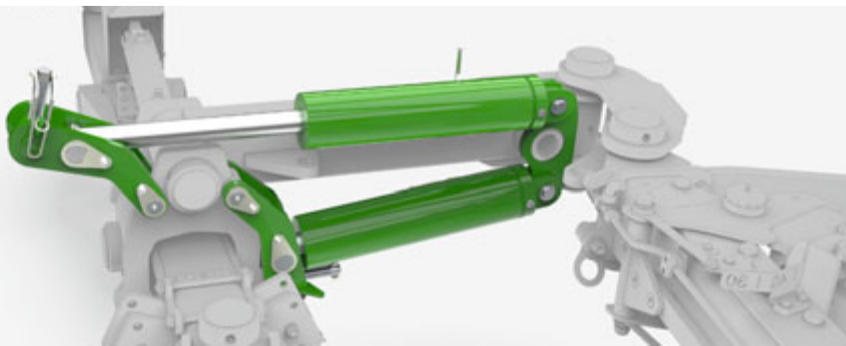
The wide furrow clearance is another big plus of the SpeedBlade bodies, especially with the increasing use of wider tractor tyres.

Pure robustness without compromises

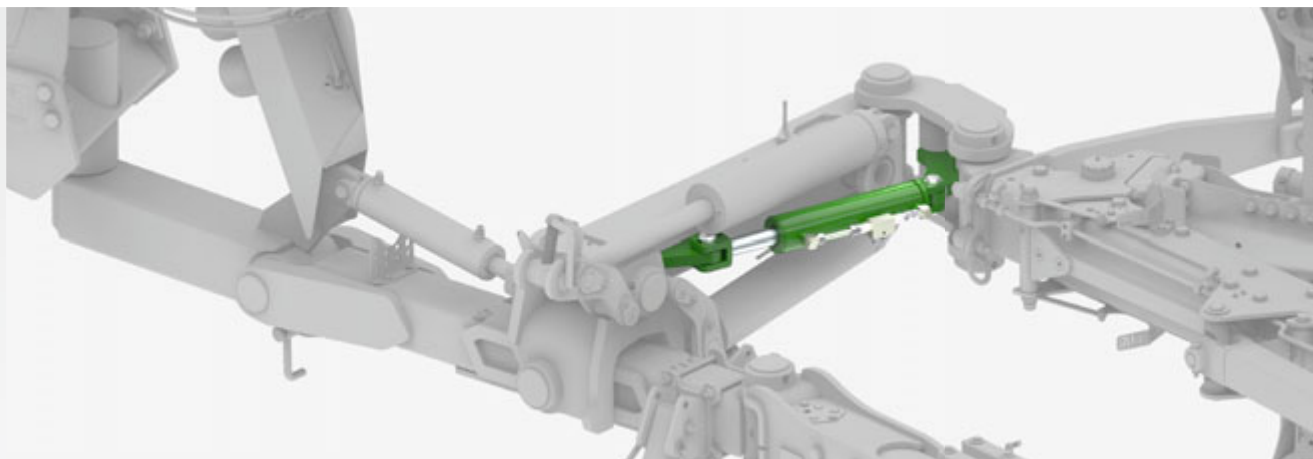
The Tyrok is particularly robust thanks to the strong, high-tensile steel rectangular tubular beam having dimensions of 200 x 150 x 10 mm. A decisive benefit over beams from other manufacturers is: the beam does not bend during work even under high loads. This ensures a uniform working depth over the entire length and working width.

The Tyrok also scores points with its new **SmartTurn** turning system. At the headland, the fast turning procedure is hydraulically slowed down twice just before the end. This results in a damping effect which reduces stress on the plough structure when the cylinder is retracted. There is no need to compromise on speed as the low-stress turnover process is completed within a period of just nine seconds.

The optionally available hydraulic overload safety protection also ensures smooth and material-protective working in arduous operating conditions. The plough body is gently pushed back into the soil via the hydraulic cylinder.



Turning cylinder with hydraulic throttle



Hydraulic cylinder for setting the front furrow width

The trigger force decreases as the lift height increases. Trip forces of up to 2000 kg can be infinitely adjusted either centrally or separately on each individual body, depending on the operating conditions.

Safe, comfortable and precise adjustment for a perfect working profile

The Tyrok is equipped with mechanical furrow width adjustment as standard. As an option, the working width can be infinitely adjusted hydraulically to suit the conditions from the comfort of the tractor cab. The new **AutoAdapt** automatic front furrow adjustment offers a huge advantage in terms of comfort and precision. The hydraulic adjustment of the overall working width automatically adapts the front furrow precisely to the changed working width using the intelligent kinematics of the Tyrok. The basic adjustment of the front furrow or possible adaption is carried out hydraulically from the cab. As a result, changing soil conditions or slopes can be responded to consistently and quickly, thereby enabling perfect matching to the last furrow.

The working depth is mechanically or hydraulically adjusted via the standard optimally damped running gear, which also absorbs large shock loads. In this respect, the substantial support wheel not only ensures precise depth control but also provides optimum soil compaction protection. In addition, the standard hydro-pneumatic suspension of the support wheel ensures maximum driving comfort and safety on the road.

The Tyrok headstock, which can rotate through 180°, ensures an optimum pull line with the minimal lateral pull, and thus reduced pull force requirement. In addition, it also provides outstanding flexibility for attachment as a result of its various coupling alternatives. The Tyrok can also be optionally equipped with **traction control** for reduced slippage. In this case, another hydraulic cylinder transfers weight to the rear axle of the tractor. This provides maximum pulling power and fuel savings.

All hydraulic functions can be conveniently accessed with very little effort from the front of the headstock in the central SmartCenter settings centre.

Completely equipped for complete performance

Optional soil engaging tools allow the new semi-mounted reversible plough to be universally adapted to all operating conditions. For example, various skimmers or trash boards are available for the clean incorporation of large amounts of organic matter. Additional landside protectors can be attached to the shares to ensure better plough guidance on slopes.



AMAZONE has expanded the packer range via a strategic cooperation with the company Tigges for even greater efficiency on your farm. As a result, it is now possible to combine the Tyrok with packers from Tigges in an AMAZONE design. Various ring diameters as well as different ring profiles are offered. In addition, there is a choice of single or double ring packers up to a working width of 4.65 m.

An optional sword landside, which protects the edges of the front shin of the mouldboard from wear and cuts a clean furrow wall, is ideal for regions with stony and heavy soils. Disc coulters can be fitted to the last body for an exceptionally clean furrow clearance.

For simultaneous reconsolidation, AMAZONE offers the Tyrok 400 with a swivel press arm for working with a packer.

The advantages at a glance:

- ✔ Efficient, easily-adjustable and robust semi-mounted reversible plough with high operational reliability
- ✔ Durable and sturdy **SpeedBlade** plough body for higher working speeds – as a result of the extended front shin of the mouldboard and ©plus hardening process
- ✔ Precise working depth over the entire length of the plough, thanks to the large rectangular tubular frame
- ✔ Perfect matching of the ploughing, even under varying conditions, thanks to the standard hydraulic front furrow adjustment
- ✔ Automatic adaption of the front furrow to the overall

working width by means of **AutoAdapt**

- ✔ Rapid and gentle turnover process as a result of the hydraulic end position damping – **SmartTurn**
- ✔ The substantial support wheel ensures an exact depth control and the optimum soil structure protection
- ✔ Maximum safety and comfort in the transport position due to the standard wheel shock-absorber
- ✔ Shear bolt or hydraulic overload safety protection for a positive re-entry into the soil
- ✔ Comfortable and central SmartCenter settings centre on the plough headstock



The Tyrok 400 has the ideal combination of a strong beam and adjustable shares for perfect field cultivation

Teres 300 mounted reversible plough

A new league of mounted ploughs – higher speeds with minimum wear



The Teres 300 delivers outstanding working quality at speeds from 8 to 10 km/h as a result of its outstanding plough body concept

Video of Teres 300 in use:
www.amazone.net/yt-teres-300





Teres 300 VS with STU 40 slatted mouldboard



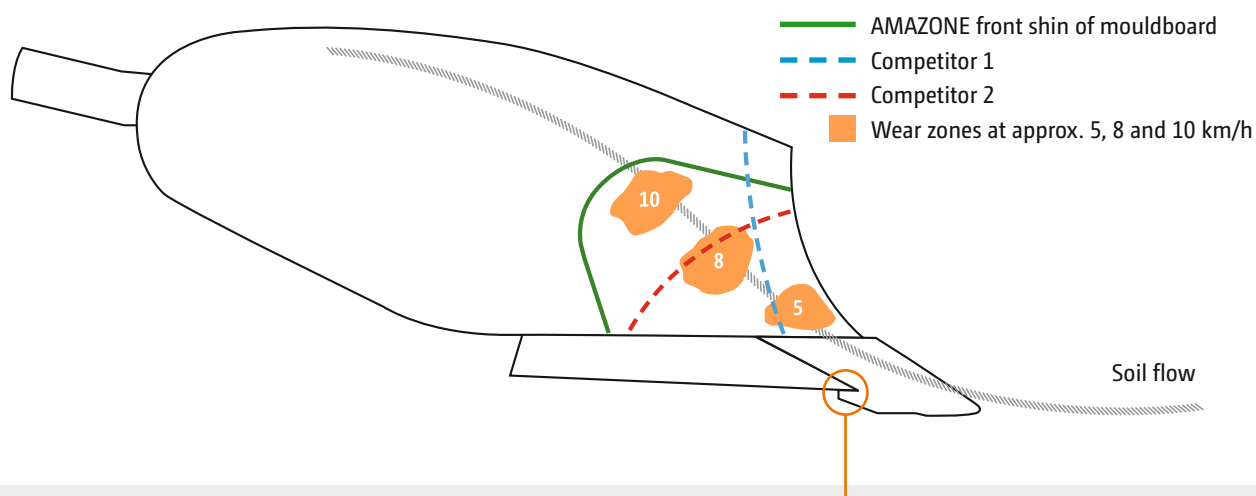
The SpeedBlade plough body ensures minimum wearing costs, even at high speeds

With the Teres 300 mounted reversible plough, AMAZONE is offering a new mounted plough with 4, 5, and 6 shares for tractors having a power rating up to 300 HP. The Teres 300 V, with hydraulic working width adjustment, or the VS with hydraulic working width adjustment and hydraulic stone release system, are equipped with the variable furrow width adjustment as standard. The plough is characterised by its simple adjustment, by its exceptional light pull and a perfect working profile. In addition, the new SpeedBlade plough bodies ensure reduced wear costs, even at higher speeds.

Plough bodies meticulously thought-through – SpeedBlade for improved performance

The new **SpeedBlade** plough body, with its patented extra-large front shin on the mouldboard, makes for minimal wear on the main mouldboard. The main wear point automatically shifts further and further back towards the centre of the plough body as the working speed increases from say 6 km/h up to 10 km/h. As a result, the main wear point of the SpeedBlade body is on the enlarged front shin of the mouldboard and not back on the main part of the slatted or solid mouldboard, even at these higher forward speeds,

SpeedBlade body with patented AMAZONE mouldboard front shin



SpeedBlade body U 40

Point covers the wing:

- ✓ The joint sits protected by the point
- ✓ Plant residues, baler twine, wire and root residues cannot get entangled



meaning, therefore, that only the worn front shin of the mouldboard needs to be replaced initially on the Teres when used at higher speeds. This enormously reduces wearing costs compared to other designs.

Another detail with great effect: the point covers the wing, meaning that the joint is protected by the point. Thanks to this clever join up, no plant residues or baler twine can get entangled. In addition, the open frog prevents soil from sticking under the frog due to its profile so that the maximum ease of pull on the plough body is maintained.

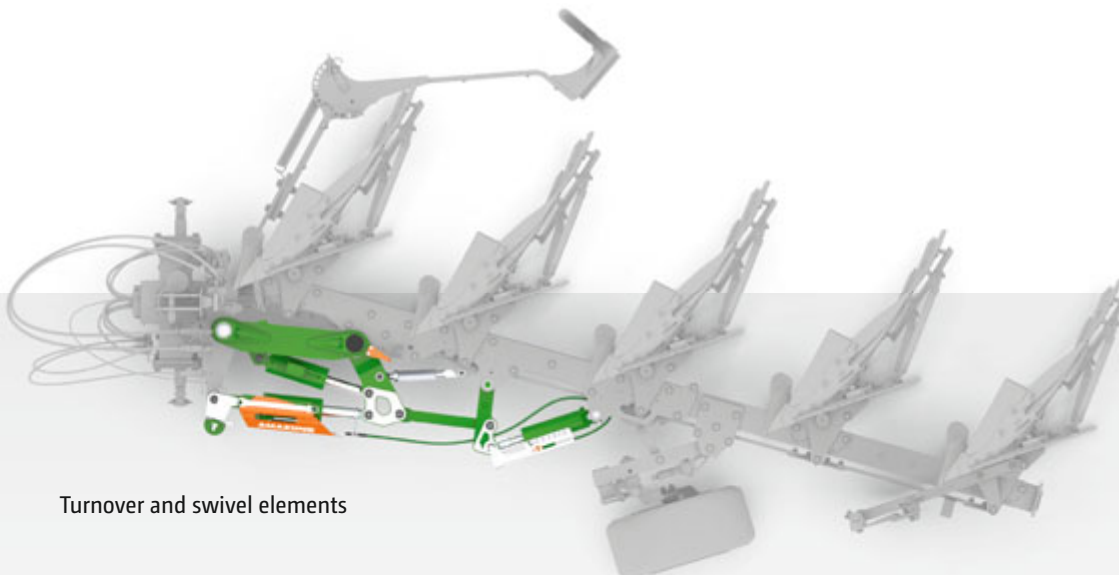
The unique **©plus hardening process** provides the basis for high quality during the manufacture of Teres wearing metal parts and is a result of the additional introduction of carbon. For example, a very high hardness and thereby a smooth surface is achieved on the front of the mouldboard which ensures a long service life. The reverse side remains, however, relatively soft and is therefore extremely tough and impact resistant.

The SpeedBlade plough body range offers a selection of different slatted and solid mouldboard profiles depending on the application and objective. The sophisticated design of the plough bodies combined with the advantages of the ©plus hardening process ensure a low pulling power requirement, thereby reducing fuel consumption. For particularly tough conditions, the points are also available as an HD option or as reversible, interchangeable points for less downtime time and less wear.

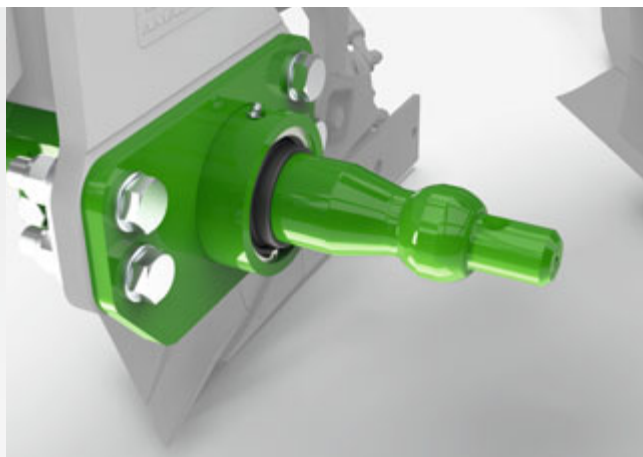
The wide furrow clearance is another big plus of the SpeedBlade bodies, especially with the increasing use of wider tractor tyres.

Simple, comfortable and precise adjustment for a perfect working profile

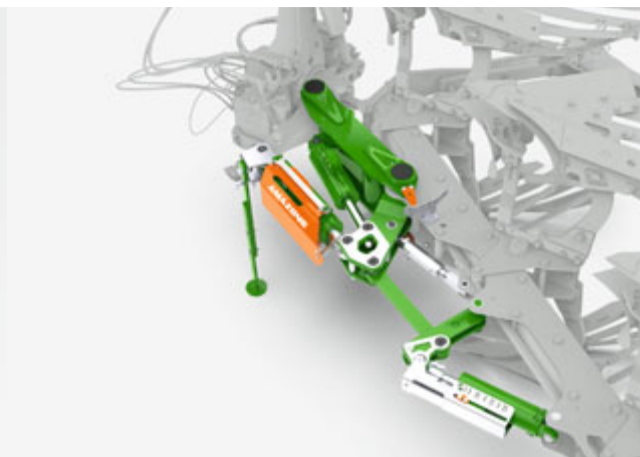
The Teres 300 V and VS is fitted with infinitely-variable hydraulic working width adjustment and front furrow adaption as standard. This means that the front furrow can both be conveniently adjusted from the cab, and also adapted to suit varying soils and when working on inclines. The driver



Turnover and swivel elements



ProtectShaft cross shaft mounted in bearings with integrated balls



The main beam is connected to the headstock by means of a parallelogram

can also very easily adjust the working width hydraulically and infinitely-variably from 33 cm to 55 cm per body using the tractor hydraulics. The new **AutoAdapt** automatic front furrow adjustment offers a huge advantage in terms of comfort and precision. This means that the front furrow is also automatically adjusted precisely when the overall working width is changed on Teres ploughs. This perfect adaption is carried out via the parallelogram and via the hydraulic connection between the working width cylinder and the front furrow cylinder. This generates perfect matching up of the ploughing when changing the working width, thus producing a tidy working profile. In addition, AutoAdapt also has a positive effect on the fuel consumption, since the pull line and the angle between the plough and the lower link cross shaft does not change.

The working depth adjustment is carried out either mechanically or hydraulically via the support wheel. AMAZONE offers the new Teres ploughs with both side-mounted pendulum support wheel and combination support wheels, as well as the pendulum support wheel at the rear. There is a range of various different tyres with differing diameters and tyre profiles in the Teres range to provide precise depth control and reliable self-propulsion.

Overload safety device for extreme applications

There are two variants for the Teres when it comes to overload safety protection. One is the shear bolt overload safety device, having a shear force of 6,200 kg. The other is the

optionally available hydraulic overload safety protection which also ensures smooth and material-protective working in arduous operating conditions. The maximum lift stroke is 40 cm, so that the bodies can also avoid large obstacles, even at a deep working depth. In addition, the bodies can also deviate to the side. The plough body is gently pushed back into the soil via the hydraulic cylinder. The trigger force decreases as the lift height increases. Trip forces of up to 2000 kg can be infinitely adjusted either centrally or separately on each individual body, depending on the operating conditions. As an additional safety feature, each plough beam also has a separate shear bolt.

Highest levels of durability and long service life

The sturdy tubular beam, 150 x 150 x 8.8 mm gives the Teres a high level of rigidity whilst maintaining a light weight. The **ProtectShaft** cross shaft, carried in bearings, with integrated lower link balls ensure low levels of wear and maximum durability. The pivot bearings have a dampening effect and protect the plough on the headland and when driving on the road. Thanks to the integrated balls, the durability of the cross shaft is increased markedly on account of the larger diameter.

The 130 mm turnover shaft, which is hollow, permits the use of two bearings of the same size. This markedly increases durability. In addition, the benefit of the hollow axle is that the hydraulic lines can be routed neatly through it.



Tidy incorporation of harvest residues and organic material

On many ploughs with larger working widths, it is necessary to swivel in the plough before turning to increase the ground clearance. The Teres therefore has a frame swivel cylinder. The gentle **SmartTurn** turning system actuates the frame swivel cylinder according to the specific working width.

Additional special equipment for perfect work

Optional soil engaging tools allow the new mounted reversible plough to be universally adapted to all operating conditions. For example, various skimmers or trash boards are available for the clean incorporation of large amounts of organic matter. Additional landside protectors can be attached to the shares to ensure better plough guidance on slopes.

An optional sword landside, which protects the edges of the front shin of the mouldboard from wear and cuts a clean furrow wall, is ideal for regions with stony and heavy soils. Disc coulters can be fitted to the last body for an exceptionally clean furrow clearance.

For simultaneous reconsolidation, AMAZONE offers the Teres 300 with a swivel press arm for working with a packer.

The advantages at a glance:

- ✔ High levels of efficiency owing to high travel speed with minimum wear thanks to the SpeedBlade with enlarged front shin of the mouldboard and ©plus hardening process
- ✔ Wide furrow clearance by the state-of-the-art plough body concept
- ✔ Perfect matching up of the ploughing, even under varying conditions, thanks to the **AutoAdapt** standard hydraulic front furrow adjustment
- ✔ Simple adaption of the front furrow thanks to the infinitely-variable hydraulic adjustment
- ✔ Rapid and gentle turnover process at larger working widths as a result of the hydraulic end position damping **SmartTurn**
- ✔ Selection of various different side-mounted and rear mounted wheels for good transport on the road and safe and tidy working on the field
- ✔ ProtectShaft **cross shaft** mounted in bearings with integrated balls



The Teres 300 VS together with the new folding KE 02 Rotamix rotary harrow

Cobra-2TX trailed shallow cultivator

The perfect ultra-shallow working system – shredding, cutting, mixing and optionally, reconsolidating



Cobra-2TX trailed shallow cultivator carrying out surface stubble cultivating

Video of Cobra-2TX in use:
www.amazone.net/yt-cobra-2tx





Good visibility of the Cobra during the day and at night

The new Cobra 6-stagger shallow cultivator from AMAZONE is characterised by its universal use and will be available in working widths of 6 m and 7 m. AMAZONE will be offering a new method for shallow stubble cultivation, second or third pass medium-deep work, or for a catch crop changeover or even seedbed preparation, with the introduction of the trailed Cobra 6000-2TX models in the summer of 2022 and 7000-2TX in the spring of 2023.

The increase in resistance to and the reduction in plant protection agents means that mechanical weed control in the second pass is continuously growing in importance. This means that the Cobra shallow cultivator will be playing an enormous role in field hygiene.

The choice of various different pre-working tools, tine variants and following rollers or harrows allows the Cobra to provide the best combination of cultivation elements for any location and every farming process.

The best combination:

6 stagger frame with ECO leaf-spring tines

The Cobra is the specialist for shallow and medium-deep work at 4 to 13 cm working depth. Thanks to the 6 stagger frame layout of the tines, the Cobra distributes and mixes harvest residues into the soil in an optimum manner. The special tine arrangement, and its associated working length, ensures an enormous throughput of organic matter and soil, despite the very tight tine spacing of 13.3 cm. A large amount of fine soil is produced in the mix by the vi-

bration of the ECO leaf-spring tines. This provides optimum germination conditions, so that volunteer cereals and weed seeds establish well, which can then be combated mechanically in the next working pass. The high proportion of fine soil also has a very positive effect on seedbed preparation. In addition, the ECO leaf-spring tines can adapt very flexibly to the soil conditions and can avoid obstacles.

Full-area movement by the cultivator ensures optimum working performance

A full surface movement and thus a full surface movement of stubble and weeds is of enormous significance for a good outcome on very shallow stubble cultivating. AMAZONE offers various different 220 mm wide goose foot shares for this working pass, so that adequate share overlap and thus a full-area movement is ensured at a tine spacing of 13.3 cm under all conditions. There is also a 50 mm narrow share for mid-deep mixing and loosening work. Both types of share are available for high outputs and also as a HD variant.



Full surface movement and intensive incorporation of organic matter thanks to the 6-stagger layout



As an option, the Cobra can also be fitted with the double harrow

Also available with a levelling unit as an option

Good levelling can be achieved by mounting a levelling unit, consisting of spring-mounted drag tines, behind the tine unit. Even consolidation can be achieved thanks to this additional levelling. If there is too much organic matter, the unit can be swung up easily and without the need for tools.

Precise working depth controlled from the tractor cab

The depth adjustment of the Cobra is carried out via the following rollers and the over-sized support wheels. They are integrated into the tine segment to provide better matching to the topography. AMAZONE mounts a coupling rod at this point to connect the components mechanically, in order to keep the relationship between the support wheels and following roller constant at all times.

If you need to operate without a following roller, the depth adjustment is carried out via the transport wheels in addition to the front support wheels. A particular feature is that there are tines mounted behind the transport wheels to loosen any tracks produced by the running gear. If you are operating with a following roller, then the running gear can be fully lifted up.

The working depth can be adjusted infinitely-variably from the tractor cab, to permit individual reaction to the changing conditions within a field. An easy-to-read scale helps the orientation of the driver.

Following roller to suit

There is a selection of ten AMAZONE following rollers, as double or single units, for optimum consolidation, so that the right roller for all types of soil is available. A particular feature of the Cobra is that the roller is guided by a parallelogram. Thanks to this connection, a constant pressure is generated for the rollers, even when adjusting the working depth of the tine area. The levelling unit is, in turn, mounted on the rollers. This means that this setting does not need to be changed when changing the working depth.

AMAZONE offers a double harrow for the rear of the Cobra 6000-2TX and 7000-2TX as an alternative to the roller. The harrow demonstrates its benefit, particularly in the second or third working pass, when combating weeds mechanically. It brings the cut weeds and volunteer cereal regrowth to the surface of the soil where they dry out.



The Cobra combined with the Double U-profile roller. A suitable roller can be selected from the familiar roller portfolio to suit the specific conditions on-site.



Cobra-2TX with leading knife roller working in rape stubble



Low pulling force for high speed working and good incorporation action

Front tools for fine shredding, levelling and crumbling

As an option, the Cobra can also be fitted with the knife roller. This allows you to thoroughly cut and chop rape stubble during the first pass, for example. However, the knife roller also offers considerable benefit when incorporating catch crops, producing a perfect working quality. The knife roller has a closed roller core and double cutter blades arranged in a V shape. This ensures smooth running and reduces wear costs. In addition, the knife roller is always hydraulically pre-tensioned and thus adapts itself perfectly to the soil conditions.

As an alternative, the Cobra can also be equipped with a leading Crushboard. This chops clods and also levels. The intensity can be varied hydraulically and infinitely-variably from the tractor seat.



Knife roller (or Crushboard) as the individual up-front tool

The new Cobra shallow cultivator is characterised by its high levels of precision and its versatility under the most varied of working conditions. In order to increase the versatility even more, the Cobra can, as an option, be equipped with the GreenDrill 501 catch crop drill.

The advantages at a glance:

- ✔ Powerful and universal shallow cultivator for shallow and medium-deep soil tillage at 4 to 13 cm working
- ✔ Intensive incorporation of crop residues as a result of the 6-stagger layout with ECO leaf-spring tines
- ✔ Exact depth control via support wheels and following roller
- ✔ Full-surface movement at shallow working thanks to the large duckfoot share overlap
- ✔ Perfect cultivation of organic matter and catch crops thanks to the front knife roller
- ✔ Even, fine-crumbed seedbed thanks to the front Crushboard and levelling element in front of the roller

Ceus-TX disc & tine- combination cultivator

For the perfect combination – shallow intensive moving and crumbling as well as deep loosening and mixing



The new Ceus 3000-TX and 4000-TX produce a perfect mix at working speeds of up to 15 km/h thanks to the combination of discs and tines.

Video of Ceus-TX in use:
www.amazone.net/yt-ceus-tx





The Ceus has the ideal combination of tools for maintaining perfect field hygiene and a finished seedbed in just one pass

AMAZONE now offers two new models of its rigid trailed Ceus disc & tine combination cultivator in working widths of 3 m and 4 m. The successful combination of discs and tines can therefore also be used on smaller farm sizes and with tractors starting from 150 HP. The new Ceus 3000-TX and Ceus 4000-TX are equipped with central running gear and impress with their precision and versatility for both stubble and primary soil tillage, deep loosening and seedbed preparation.

The combination of discs and tines means that the Ceus produces a perfect mix at working speeds of up to 15 km/h. Straw, stubble or catch crops are finely shredded by the up-front discs and then, in conjunction with the following tine segment, the organic matter is evenly mixed, even where large quantities prevail. This combination of tools enables the Ceus to create the best conditions for rapid decomposition and excellent field emergence with minimal disease pressure on the following sowing operation.

The function principle in detail

The leading disc element is equipped with large diameter discs which shred the organic matter and leave a fine crumbed soil structure for optimum sowing conditions. The discs are available in smooth and serrated versions and, thanks to their independent suspension, ensure a high passage volume and good contour following during intensive cultivation. The stone release system via rubber spring elements is maintenance-free.

With a tine spacing of 40 cm, the following tine segment reliably incorporates any organic matter, even in large quantities, and is easy to pull while maintaining a high level of through-passage. The depth of the tines can be adjusted down to 30 cm. However, it is also possible to work in shallow mode, so that the point runs just below the working depth of the disc harrow in wet and heavy conditions. This loosens the horizon and creates a rough structure in the soil, thereby significantly reducing the risk of capping on these types of soil. A selection of different C-Mix shares is available for the tine segment. The extensive range offers the right share for every area of application. We also offer the C-Mix Clip quick-change system, which enables the points to be exchanged easily and conveniently. Various hard-wearing HD shares are also available for an extended service life.





The Ceus impresses with its precision and versatility on both stubble and primary soil tillage, deep loosening and seedbed preparation, especially where large quantities of organic matter prevail

The C-Mix Super tines are equipped with a pressure spring overload safety protection system for high levels of operational reliability, even under the toughest of conditions. As an option, the new C-Mix Ultra tines with automatic overload protection via hydraulic cylinders can also be specified for the Ceus-TX. Here the trip force can be infinitely adjusted up to 800 kg. On the one hand, this ensures that the desired working depth of up to 30 cm is precisely maintained. Whereas on the other, the C-Mix Ultra system protects the cultivator from extreme loads by means of highly-dampened resetting of the tine after tripping.

The tine segment is followed by a set of levelling tools, which can be equipped with smooth or serrated discs or spring tine levellers from choice. The height and inclination of the side discs can be adjusted separately to ensure optimum match up from bout to bout.

Eleven different rollers and various rear harrows are available for that final reconsolidation. The roller can be removed in particularly wet conditions, e.g. in spring, and work carried out without reconsolidation, so that the loosened soil can dry and warm up more quickly.

The option of hydraulic depth adjustment for optimum adaptation to the specific soil conditions is particularly convenient, and is available for all the working segments.



Ceus 4000-TX disc & tine combination cultivator for intensive mixing and deep soil loosening

C-Mix Ultra tine system with hydraulic overload safety device

High levels of safety deployment for Cenius trailed cultivator and Ceus disc & tine combination cultivator



Video of Ceus 5000-2TX in use:
www.amazone.net/yt-ceus-ultra





The high trigger force of up to 800 kg ensures a consistent working depth and protects the frame

AMAZONE has extended its range of options for its Ceni-us-2TX trailed cultivator models, in working widths of 4 to 8 m, and the Ceus-2TX trailed disc & tine combination cultivators, which are available in working widths from 4 to 7 m, with the addition of the new C-Mix Ultra tine. The new tine system is equipped with an automatic overload protection that utilises hydraulic cylinders and so offers a high reliability and durability, especially in extreme operating conditions.

Ultra overload safety device for the most strenuous of conditions

The strengths of the C-Mix Ultra tine becomes apparent in challenging soil conditions where the tine protection system is being regularly overloaded. This new hydraulic variant enables the trigger force to be adapted to the conditions and is infinitely-adjustable up to 800 kg. This provides a high level of operational reliability, because the machine optimally maintains the desired working depth of up to 30 cm even under the toughest of conditions thanks to the high trip clearance of the individual tines. In addition, the Ultra overload protection system protects the cultivator in a unique way: The system, consisting of the hydraulic cylinders installed on the tines and the centralised hydraulic accumulators, provides highly dampened resetting of the C-Mix Ultra tine after triggering. This also has a very beneficial effect on the wear and tear of the overload protection system, even in the case of frequent triggering.

The number of hydraulic accumulators is adjusted to the specific number of tines so that there is only a small pressure difference when several overload protection devices are triggered simultaneously.



The C-Mix Ultra tine is dampened via the hydraulic cylinder when it is reset after triggering

Stepless adjustment of the system is easily and conveniently carried out from the front on the drawbar. The pressure gauge is also located there and can be easily observed from the tractor seat for convenient monitoring.

C-Mix share system for all applications

The new C-Mix Ultra tine can be combined with the complete C-Mix share system. The extensive range offers the right share for every application. Some of the shares are available as highly wear-resistant HD variants.

We also offer the C-Mix-Clip quick-change system, which enables the points to be exchanged easily and conveniently. The point is separated from the guide plate in next to no time. This ensures less downtime and, above all, a reduction in the wearing costs.



Shallow soil tillage with the **AMAZONE C-Mix duckfoot share**

Now also available in a highly wear-resistant, HD variant



The AMAZONE C-Mix duckfoot share can be fitted to all Cenio and Cenius cultivators.

Video of Cenio 3000 Special
with duckfoot share in use:
www.amazone.net/yt-cenio-hd





The extensive AMAZONE C-Mix share range now includes a 320-mm-wide duckfoot share for shallow, full-surface soil tillage.

Due to increasing requirements for field hygiene and more attention to ground water conservation, shallow soil tillage is becoming increasingly important. Weed seeds and volunteer grains need to be kept near the soil surface, whilst germinated plants are completely cut off at the root. Full-surface, light soil movement not only fights weeds, but also disrupts negative water capillary action near the surface. This allows valuable ground water to be preserved for the subsequent crop.

New soil tillage tools are constantly being developed to meet this need. When it comes to cultivators, the most suitable tool for shallow, full-surface soil tillage is the duckfoot share. Compared with a wing share, the duckfoot achieves significantly shallower working. For cultivators in the Cenio and Cenius product ranges, AMAZONE offers the C-Mix duckfoot share with a width of 320 mm. With a maximum tine spacing of 30 cm, there is a 2-cm overlap between the shares. This ensures uniform, full-surface movement, whatever the conditions. In addition, the C-Mix duckfoot share is extremely flat along its entire width, so that it remains parallel to the ground surface and ensures a uniform, shallow cut. Germinated weeds and volunteers are cleanly cut, so they can dry out.

For optimal results, the wear condition of the share is extremely important. For a longer lifespan, AMAZONE now offers the duckfoot share in a highly wear-resistant HD variant. This features additional hard metal plates that are soldered into place and continually self-sharpen during the soil tillage process. This extends the service life of the share considerably and ensures consistent, clean results.



The HD variant extends the service life of the AMAZONE C-Mix duckfoot share many times over and ensures optimal results.

X-Cutter disc for very shallow soil tillage

Maximum shredding capacity and mixing intensity for the Catros compact disc harrow



The X-Cutter disc moves the full surface at a shallow working depth thanks to its special wavy profile

Video of CatrosXL 3003 with
X-Cutter disc in use:

www.amazone.net/yt-catrosxl3003-x-cutter-disc





Equipped with the GreenDrill 200 for simultaneous application of catch crops



The X-Cutter disc ensures a particularly high proportion of fine soil. This provides the optimum germination conditions when used for the simultaneous broadcasting of catch crops.

AMAZONE has extended the range of tool options for the Catros compact disc harrow with the new X-Cutter disc. This special, wavy profile disc is used for very shallow soil tillage. The new X-Cutter disc has a diameter of 480 mm for a high peripheral speed and performs optimally at working depths from 2 to 8 cm. Thanks to the special wavy profile, the discs maintain that full-surface cultivation across the entire working width, even at these very shallow working depths. The special disc profile produces an intensive movement of the full-surface area and is sure to impress with its high mixing intensity close to the surface that generates faster rotting. This provides optimum conditions for the following crop. The X-Cutter disc also scores with its low pulling power requirement.

Optimum shallow chopping and mixing

Very shallow tillage plays an increasingly important role when it comes to carefully managing the water balance in the soil. Shallow tillage significantly reduces the loss through evaporation of valuable soil moisture, particularly in hot and dry summers. Much less soil is moved than with other discs, which need to operate at much greater depths to move the full soil surface.

The demand to maintain field hygiene is also increasing. After harvest, the soil should be worked only very shallowly so that volunteer grains, volunteer rape and weed seeds are not buried deeply but are kept in the surface area by the very shallow cultivation. This means that these seeds have excellent germination conditions and these unwanted



The X-Cutter disc is available as an option for new orders or for retrofitting to various models from the Catros⁺ and Catros^{XL} compact disc harrow range



X-Cutter disc with wavy profile


Catros^{XL} 3003 with X-Cutter disc, knife roller and GreenDrill

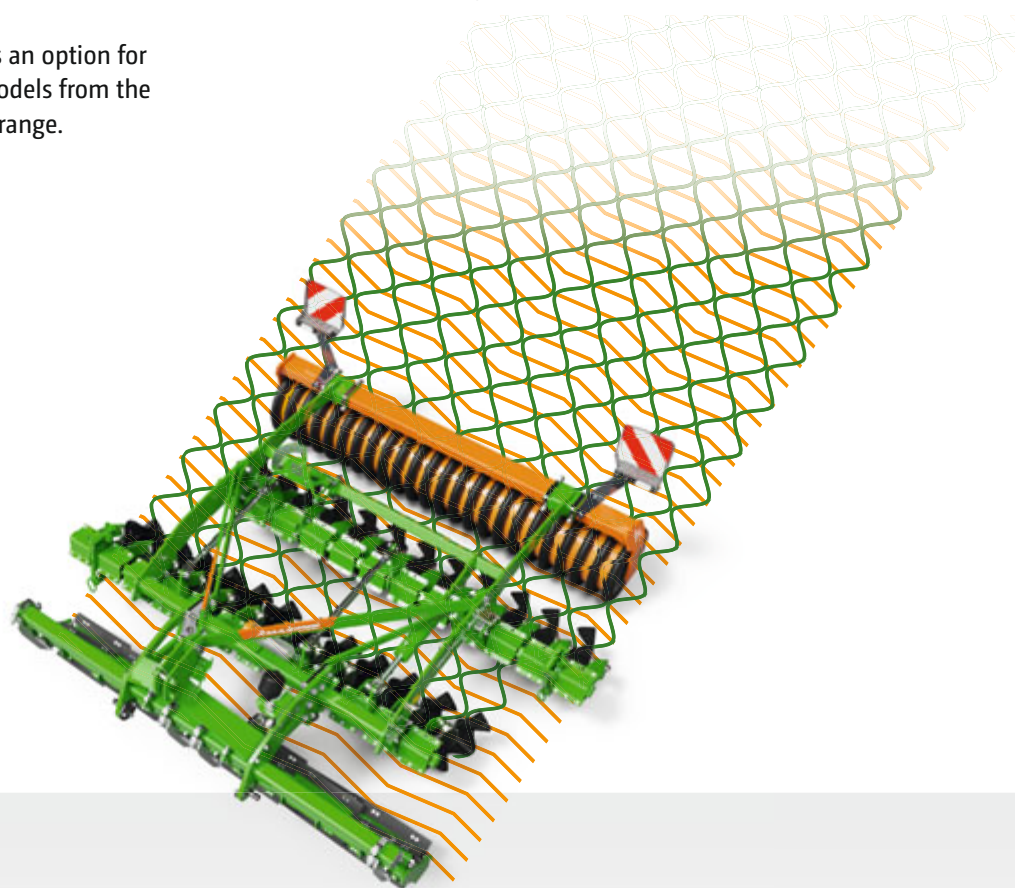
plants are then mechanically removed in the subsequent tillage operation, in order to obtain a clean start for the following crop.


The X-Cutter disc also does a great job in tall catch crops thanks to its full-surface cut. Optimum shredding at a shallow working depth in conjunction with intense microbial activity in the top soil layer promotes faster rotting of the catch crop.

This new special profile disc is available as an option for new orders or for retrofitting to various models from the Catros⁺ and Catros^{XL} compact disc harrow range.

Optimally combines with the knife roller

Furthermore, AMAZONE has another newcomer in the product range, the up-front knife roller. The combination of Catros with the X-Cutter disc and the knife roller enables a multi-dimensional cutting action to take place, thereby increasing the longitudinal and lateral shredding intensity in stubbles, straw and catch crops. The decomposition process is therefore yet further enhanced and the transmission of disease to the following crop reduced.



-  Knife roller
-  X-Cutter disc

In conjunction with the up-front knife roller, the X-Cutter disc creates a multi-dimensional cutting action to maximise the shredding of organic matter, even where large amounts prevail



Ultra-shallow and intensive mixing of the soil and cutting the crop residue in combination with the knife roller

Project: TopCut tool carrier

Will the stubble cultivating in the future be ultra-shallow?



The TopCut tool carrier for climate-adapted cultivation. The farmer can choose various different tools to suit the conditions.



We intend to have lots of combination options and trailed units to choose from in the future

The challenge:

The subject of soil tillage is gaining more and more significance in the purchasing process on farms. The bigger the problems with lack of moisture, chemical resistance and the requirement for reducing the amount of plant protection agents, the more important the correct soil tillage becomes. A particular emphasis is placed on the initial stubble cultivation. This is precisely where the biggest challenge lies. On the one hand, we need to produce the optimum seed-bed for stimulating the growth of volunteer cereal and weed seeds. This means that undesirable growth can be encouraged directly after stubble chitting and then be combated mechanically in the second cultivation pass. Ultra-shallow work with optimum germination conditions for the stray cereal and weeds and grasses is of extreme importance, particularly with regard to old rape growth, and in the problem areas of black grass and loose silky bent.

In addition, rotting of organic matter is of enormous significance for field hygiene. Good rotting reduces the transfer of fungal disease and pests. It is therefore important to make sure that shredding or preparation of the organic matter be already undertaken during the initial processing.

On account of the increasing dryness of summers, it is important that evaporation be reduced and ground water conserved. For this reason, in the initial pass, it is important to work only as deep as necessary.



Instead of the harrow, the tool carrier can, as an alternative, also be equipped with various different rollers for good consolidation

The solution: TopCut tool carrier: for ultra-shallow soil tillage

AMAZONE has started the TopCut development project to accommodate this increasing requirement for ultra-shallow soil tillage, and this will be presented to the public at the AGRITECHNICA 2022 exhibition. The challenge in this project was the development of the optimum tool combination for ultra-shallow soil tillage. The following aspects were taken into account:

- ✔ Organic material should be shredded to aid the rotting process
- ✔ Adequate fine soil should be generated for optimum germination conditions
- ✔ Working should be as shallow as possible - no burying of seeds and reduction in evaporation
- ✔ Perfect soil adaption of the tools is a prerequisite
- ✔ Straw post-distribution should be carried out if required
- ✔ Under dry conditions, good consolidation is required for optimum germination conditions

Soil tillage that has a range of different tools available to the farmer to suit the operational requirements is needed to meet all these requirements in the various different cultures.

The first TopCut 12000-2 tool carrier, having a working width of 12 m and a range of tools thus entered field trials in the summer of 2021.



High output with perfect cutting effect

Various different tools for ultra-shallow processing

Alongside the classic deployment after rape, catch crops or sunflowers, where a combination of a double knife roller and a harrow or roller is used under optimum damp soil conditions, we intend also to develop tools that produce sufficient fine soil under dry conditions, and in cereal stubble, for optimum germination conditions.

The TopCut consists of three subsequent tool segments that can be equipped with various different tools to suit the customer's needs and requirements. So the toolbar may be a single knife roller, a crushboard or a wavey disc. The double knife roller then operates in the main tool area. As an alternative, however, you can use double wavey discs or a combination of wavey discs and knife rollers. We intend also to include various different spading discs and star discs in the tests. The wavey, spading and star discs cultivate the soil only to a minimum extent, but, on the other hand, they produce fine soil for optimum germination conditions.

Consolidation or harrow

Under dry conditions, it is an advantage if the lightly worked soil is pressed down again. Here we have the option of using the TopCut with a roller, such as the KWM 650 wedge ring roller with matrix profile. In addition, you can also run a single row harrow element in front of the roller. As an alternative to the roller, you can also install a three-row straw harrow as the trailing tool. This provides post-distribution of the straw and also shakes seeds out of the straw, the pods or the ears.

Successful practical experience

In 2021, the TopCut 12000-2 ran with various different tool combinations on various different agricultural operations, under the most varied of conditions. This was supplemented by a field trial carried out with the University in Bernburg on rape and wheat stubble, to assess the tool combinations with regard to growth behaviour, shredding effect, working depth and other parameters.

Results so far demonstrate the benefits of the TopCut tool carrier:

- ✔ Ultra-shallow soil tillage with high proportion of fine soil for perfect germination conditions, even on cereal stubbles
- ✔ Markedly reduced evaporation as compared with other processes
- ✔ Optimum consolidation for reliable regrowth
- ✔ Perfect shredding effect in rape, sunflowers, maize stubbles and catch crops
- ✔ High output with low fuel consumption

In 2022 we will be building more machines to gather more experience with various different tool combinations in diverse operations under various different conditions.



TopCut with three-row straw harrow in rape stubble

KE 02 Rotamix rotary harrow

High-output new models in working widths of 3, 4, or 6 m



The tool carriers are fitted with the trailing tines on the KE 02 Rotamix which produce a very good crumb structure

Video of the KE 3002-240 in use:
www.amazone.net/yt-ke02





The DirectDrive gearbox dissipates the power flow directly to the spur gears of the tool carriers

AMAZONE offers new rotary harrows for high tractor power ratings of up to 240 HP, at a working width of 3 m and up to 400 HP at a working width of 6 m. The new KE 02, in 3 m, 4 m and 6 m working widths and featuring the innovative Rotamix system, comes into its own when intensively soil crumbling, especially on heavy ground.

The Rotamix system – close-coupled, compact and with two extra tool carriers

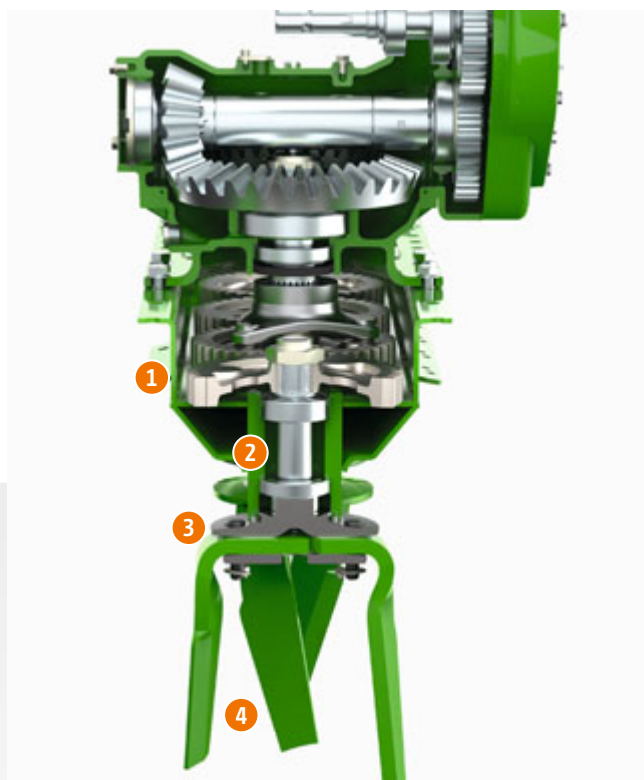
The KE 02 with the Rotamix system has four tool carriers per metre of working width. The incoming power is evenly distributed across these rotors. The trailing tines produce a very good crumb structure meaning that the new rotary harrow achieves excellent results on heavy ground and is suitable for creating the optimum seedbed, especially after ploughing.

The four tool carriers per metre working width facilitates a small spur gear diameter. This layout meant that a very compact and light design of the robust rotary harrow trough was possible. This compact design of the rotary harrow reduces the lift capacity requirement on the tractor and any harrow-mounted seed drill is positioned very close to the tractor when used in a drill combination. The lifting power requirement is therefore lower than that of other rotary harrows, which also makes for a positive impact on front ballasting.

The Long-Life-Drive system ensures a long service life and very smooth running. The double sealing system with cassette seal and labyrinth seal protects against dust, moisture and dirt ingress. The tried and tested Quick+ Safe system provides the 290 mm tines with an integrated stone release plus the tines can be easily exchanged without the need for tools.

A higher class of performance with the DirectDrive gearbox

At the heart of the new KE 02 Rotamix is the DirectDrive gearbox, via which the higher power flow is transmitted directly to the spur gears of the tool carriers. As in the case of the KX and KG rotary cultivators, there is no power redirection thus ensuring an excellent, low-wear, power transmission. The 3 m and 4 m working width rotary harrows can be used with PTO shaft speeds of 540, 750 and 1,000 rpm - at 6 m working width it is 1,000 rpm. Exchange gear sets allow the harrow rotor speed to be adapted to different soil conditions and the tractor PTO shaft speed.



- ① Compact spur gear trough in sturdy design with reduced diameter spur gears, slim design, robust 45 mm shaft diameter, 6 mm trough wall thickness and a double-skinned trough bottom
- ② Tine carriers forged from a single piece
- ③ Quick+Safe system: Quick change tine system with integrated stone release
- ④ 290 mm long KE trailing tines



The new KE 3002-240 with the Rotamix system has twelve tool carriers and is characterised by its very compact, short design

QuickLink quick coupling system for 3 m and 4 m working widths

The entire AMAZONE active soil tillage range with a working width of 3 m and 4 m is available with the QuickLink quick coupling system for maximum flexibility. The new rigid KE 02 Rotamix models can also be mounted under different seed drills via the QuickLink system with very little effort. The KE 02 Rotamix forms a compact team with the Cataya harrow-mounted conventional seed drill and the Avant 02 pneumatic front tank system. Thanks to the reinforced headstock, the Centaya Super pneumatic seed drill can now also be used with this new rotary harrow. The new Precea-A harrow-mounted precision air seeder can also be connected without tools and, it goes without saying, that a combination with the D9 mounted conventional seed drill via the "Liftpack" system is also possible.



As an example, the new KE 3002-240 Rotamix can be connected to the new Precea 3000-A harrow-mounted precision air seeder via the QuickLink system with very little effort

Setting and tools

The optional hydraulic depth control is a new feature of the KE 02. This allows the rotary harrow to be easily tailored to the field and operating conditions from the tractor cab whilst on the move. A scale assists in constant monitoring of the working depth.

Extendable lower links allow the rigid version of the KE 02 Rotamix to be individually aligned for any tractor size. This also facilitates attachment of tractor wheel mark eradicators. In addition, the lower links can be adapted to suit linkage dimensions of Cat. 3 or Cat. 3N.

The height of the levelling board for levelling the soil is precisely guided by the roller. The levelling board also deflects upwards thanks to the integrated overload protection. A universal setting tool is offered for precise adjustment, which can also be used for many other adjustments on the machine, such as for adjusting the height of the side plates or for setting the track markers.

Versatile roller range

Numerous roller types with different diameters for targeted reconsolidation are available for a wide range of site-specific requirements. The extensive range extends from the light cage roller to the wedge ring roller, which is also available in the matrix profile, the trapezium roller and the tooth packer roller for medium to heavy soils.

The advantages at a glance:

- ✔ Direct power transmission and long service life thanks to DirectDrive gearbox
- ✔ High-performance due to power output of up to 240 HP or 400 HP
- ✔ Compact construction due to reduced tine carrier diameter
- ✔ QuickLink quick coupling system for rigid KE 02 Rotamix
- ✔ Good crumbling due to four tool carriers per metre of working width
- ✔ The versatile roller programme offers the right choice for any soil type



KE 6002-2-400 with Rotamix system for use after inversion soil tillage





**New seeding
technology**



TwinTeC Special double disc coulters

The new coulters for perfect depth control and easy handling for the Cataya Special





In 2019, the Cataya conventional drill range was extended by the addition of the compact Cataya Special with 650 l seed hopper and the RoTeC single disc coulters.

TwinTeC Special precise double disc coulters

AMAZONE now offers the TwinTeC Special double disc coulters for the Cataya Special. The short, compact Cataya Special has been designed for tractors starting from 120 HP and, together with the TwinTeC Special double disc coulters, is the perfect machine for ploughing and mulch sowing on small to medium-sized farms. The double disc coulters, carried on a single arm, and having a diameter of 340 mm provides for smooth running with its maximum coulters pressure up to 40 kg. The Control 50 depth guidance roller keeps the coulters at a constant depth and the seed is precisely placed and then embedded in the soil. Very even longitudinal distribution along the row, precise depth control and outstanding field emergence are achieved at forward speeds of up to 10 km/h.

Comfortable coulters adjustment

Any adjustments to the TwinTeC Special coulters on the Cataya Special are carried out centrally, and in a user-friendly manner, by the use of the universal operating tool from the rear of the machine. The placement depth is adjusted on the left and right behind the machine using two hexagon-section shafts. The coulters pressure is controlled centrally in the middle at the back of the machine via a spindle.

The advantages at a glance:

- ✔ Maintenance-free TwinTeC Special double disc coulters for perfect depth control
- ✔ Operator-friendly handling



Thanks to the QuickLink quick coupling system, the Cataya Special can be very easily combined with the relevant soil tillage tool. It is possible to have a rotary harrow, a rotary cultivator or a combination with the CombiDisc compact disc harrow.

Mounted combination: Precea precision air seeder with CombiDisc 3000 compact disc harrow

The best of both worlds



Precea 3000-ACC Super with CombiDisc 3000

Coupling of the mounted CombiDisc 3000 compact disc harrow to the Precea precision air seeder via QuickLink



The perfect combination solution for light to medium soils at forward speeds of up to 15 km/h

The Precea high-speed precision air seeder ensures very precise seed placement as a result of its new over-pressure separator. The seed is separated individually into each seed row and is introduced into the soil via the propulsion channel. The Precea 3000-A Super is suitable for forward speeds up to 15 km/h and is thus ideal for combination with the CombiDisc 3000 mounted compact disc harrow.

Seedbed preparation and sowing row crops in a single pass

The CombiDisc mounted compact disc harrow serves as the passive soil tillage for a wide range of AMAZONE drill combinations. This allows AMAZONE also to offer a passive soil tillage machine, alongside its PTO-driven soil tillage ranges, such as the rotary harrow and the rotary cultivator for its drill combinations. The combination with the Precea-A precision harrow-mounted seed drill is new.

Ideal for seedbed preparation

The CombiDisc has a working width of 3 m and is comprised of two rows of discs, one after the other. Each row of discs is comprised of 12 serrated discs, each having a diameter of 410 mm. In each case, two discs are coupled on a single disc arm. The disc arms are carried in rubber spring elements as standard. The disc bearings are maintenance-free, of course.

Working depths of 3 to 8 cm can be achieved. This makes the disc harrow ideal for seedbed preparation on light to medium soil structures. The working depth of the two rows of discs can be adjusted mechanically, or alternatively via a hydraulic cylinder from the tractor cab.

The rapidly-rotating discs provide a very good crumb structure. The genuine working width of 3 m ensures full-area soil tillage in front of the seed drill. Perfect levelling of the seedbed is ensured by adjustable disc carriers in the wheel tracks and at the machine ends.

Proper reconsolidation of the soil is provided by a following roller from the wide range of AMAZONE rollers.

The seed drill is quickly and safely attached via the Quick-Link quick coupling. The CombiDisc 3000 compact disc harrow is coupled to the tractor via Cat. 2 or Cat. 3 lower link mountings. Simple mounting is supported by the incorporation of a hose rail to facilitate connection of the hydraulic hoses.

Precea 3000-ACC mounted on the CombiDisc 3000

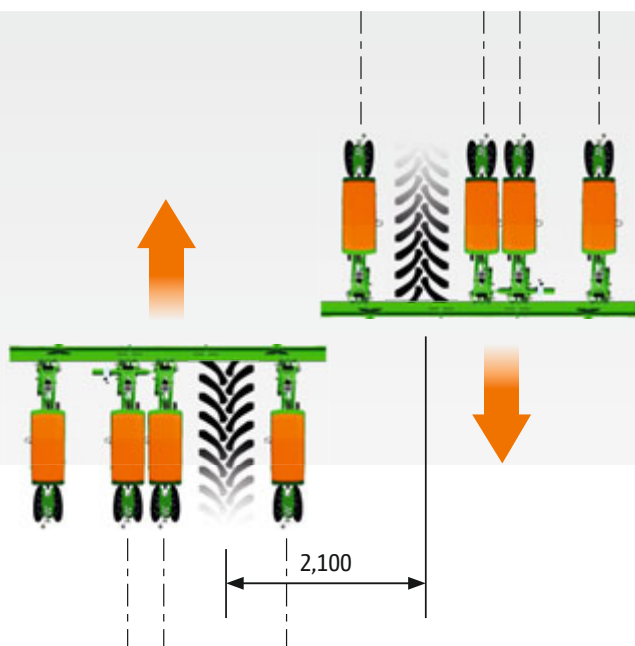


Hydraulic tramline offset for Precea precision air seeder

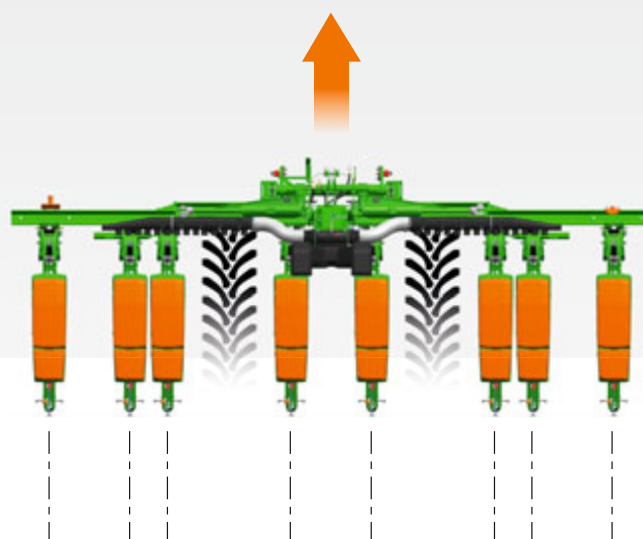
Maintaining the seed rate even when tramlining



Hydraulic tramline offset on the Precea 6000-2FCC – asymmetric arrangement



The asymmetric offset permits track widths up to 2.1 m



Symmetric tramline offset on the Precea 6000-2

Hydraulic tramline offset

The idea of the hydraulic tramline offset is to produce crop care tramlines without having to switch off the singling units, thus avoiding reducing the seed rate. The singling units are not switched off for the tramline, they are simply moved apart. On the AMAZONE Precea, the fertiliser coulters are also moved alongside the displacement of the sowing units. The maximum offset distance of the units is 400 mm. However, this distance can be limited if the full distance is not required.

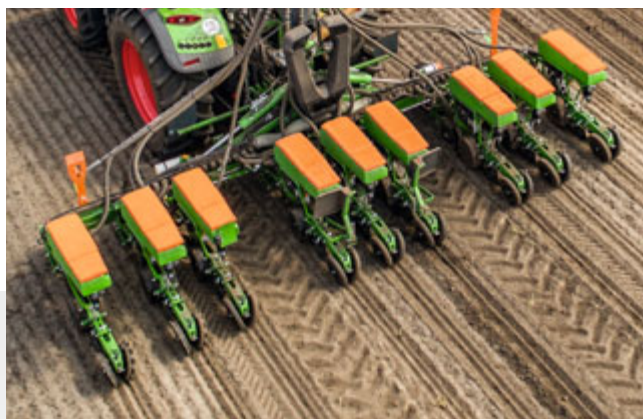
The hydraulic tramline offset can be either symmetric or asymmetric. With a symmetric offset, the cylinders for offset on the right-hand side and on the left-hand side of the machine are powered at the same time. With an asymmetric offset, just one cylinder is powered and thus just one unit is displaced. For example, the driver produces a tram-

line with just one wheel mark for the following crop care machine in the first pass, and then produces the second wheel mark in a second pass. The system is incorporated in the ISOBUS machine software to make it easier for the driver, and it reacts automatically as soon as it comes to the generation of the tramline.

The hydraulic tramline offset system is very flexible and thus offers many combination options for track width, tyre width and sprayer boom width, depending on the working width of the precision air seeder. The hydraulic tramline offset can be used on all Precea models, with the exception of the telescopic machines.

The advantages at a glance:

- ✔ Optimum yield potential since the seed rows do not need to be switched off, they are just displaced
- ✔ Relief for the driver by automatic detection and adaptation to make the tramline
- ✔ Lack of plant damage during subsequent working in the crop, as a result of the existing tramline
- ✔ Optimum fertiliser supply since the fertiliser coulters and the singling unit are displaced together



Hydraulic tramline offset on the Precea 6000-2FCC – symmetric arrangement

SmartForce automatic coulter force regulation for Precea Super precision air seeders

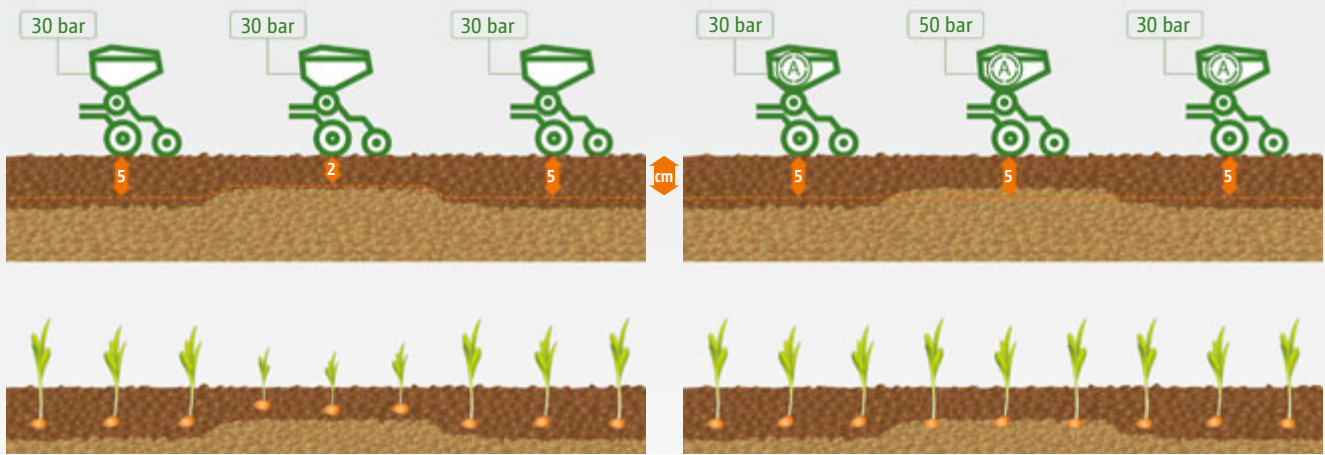
Automatic coulter pressure regulation for very consistent placement depths



Precea 6000-2CC Super in operation

Stefan Kerkerling field report:
www.amazone.net/yt-testimonial-precea





Hydraulic coulters pressure **without** automatic system gives inconsistent placement depth

Hydraulic coulters pressure **with** automatic system for consistent placement depth

Maintaining a consistent placement depth on varying soils or with uneven reconsolidation is a particular challenge for the technology and the user.

AMAZONE offers the SmartForce automatic coulters pressure regulation system for the Precea Super precision air seeder as an add-on to the hydraulic coulters pressure adjustment.

The particular feature with this system is that the driver does not stipulate the coulters pressure, but rather sets the contact force in the terminal. This contact force is checked by measuring pins in the field. This contact force will vary

according to the different soil conditions. On the basis of the measured contact force on the PreTeC coulters, SmartForce regulates the required coulters pressure in order to keep the placement depth consistent. This means that the coulters pressure will be automatically adapted to suit the various different soil conditions on the move. This ensures that the intended contact force and the placement depth are maintained under all soil conditions.

Simultaneous maintenance of a consistent placement depth and optimum pressure relieves the driver, ensures high field emergence and provides the basis for good yields.



The coulters pressure is adjusted automatically via the hydraulic cylinder on the Precea Super

Knife roller as a front tool for the Cirrus 6003-2 trailed cultivator drill

Reducing working passes saves water, time, and money



Cirrus 6003-2C sowing winter wheat after sunflowers



Knife roller for Cirrus 6003-2 - unique

AMAZONE is starting, right now, to offer a knife roller as a front tool for the Cirrus 6003-2 folding trailed cultivator drill. The enclosed roller core design with chevron knife arrangement is a unique feature. The knife roller provides additional crumbling on cloddy soils and ensures the intensive shredding of crop residues. Catch crops and tall stubble are cut at right angles to the direction of travel. Reducing the working runs saves time and restricts the evaporation of scarce groundwater.

Diverse applications with the Cirrus cultivator drill in combination with the knife roller

Preparation for cereals after sunflowers involves cutting the tall stalks at right angles and aligning them in the longitudinal direction by the Minimum-TillDiscs. The seed placement accuracy is thereby considerably increased since the sowing coulters is not lifted up by the crop residues.

Comparable field emergences with reduced machinery costs:

left – crumbling by knife roller;

right – reconsolidation with T-Pack tyre packer

Even shredding and incorporation of maize stubble promotes good field hygiene after the maize harvest. The knife roller on the Cirrus 6003-2 saves an additional run with a mulcher, a roller or a disc harrow for cultivating stubbles.

The knife roller improves the outcome by enabling direct sowing into a standing catch crop. The catch crop is cultivated intensively in a single pass and incorporated in the soil, if necessary.

The combination of working passes reduces the required number of passes across the field. The soil structure is protected and costs are saved.





The knife roller as an aggressive front tool for the Cirrus 6003-2

Extremely robust and maintenance-free

The Cirrus 6003-2 is characterised by its extreme robustness. The sturdy roller bearing mounts and the knives made from Boron steel are identifiable characteristics and ensure a long service life. The fixings for the knives are recessed in the round tube on the roller. The enclosed roller core is extremely insensitive to stones and dirt contamination. The knife roller is absolutely maintenance-free as a result of the spherical roller bearings and the face seals. Reversible blades, sharpened on both sides, halve the wear costs.

Perfect working profile

A unique selling point of the knife roller is the V-shaped arrangement of the knives. Lateral pull is eliminated by this special knife layout.

The soil adaption of the individual knife segments is achieved by a hydraulic pre-tension system. This means that the machine operates evenly over the entire working width, even on undulating ground.

The advantages at a glance:

- ✔ Fewer passes as a result of the machine combination
- ✔ Cost savings as a result of fewer working passes
- ✔ Even field emergence on widely varying soils



Use of the knife roller to produce a fine soil seedbed when sowing wheat





green orange



**Innovations
in fertilising
technology**

The wind on your side

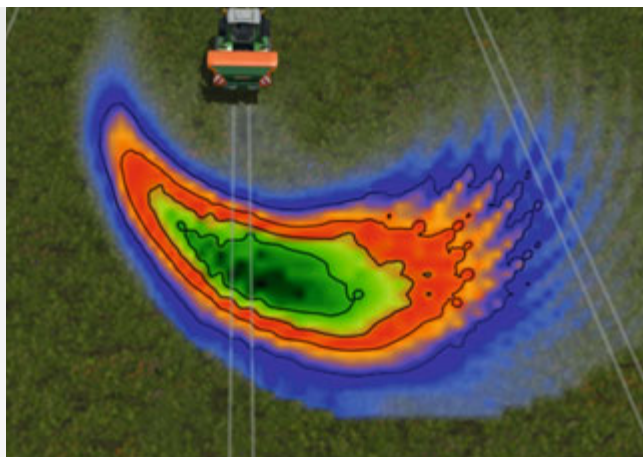
AMAZONE WindControl is now available independently of ArgusTwin.



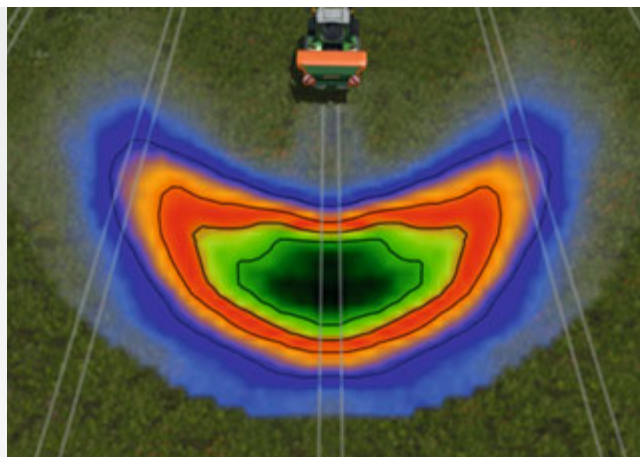
AMAZONE WindControl ensures an optimum lateral distribution even in crosswinds

More Information:
www.amazone.net/en-windcontrol





Without WindControl: Crosswinds affect the distribution pattern and change the lateral distribution



With WindControl: WindControl counteracts the effect of a crosswind ensuring an optimum spread pattern at all times

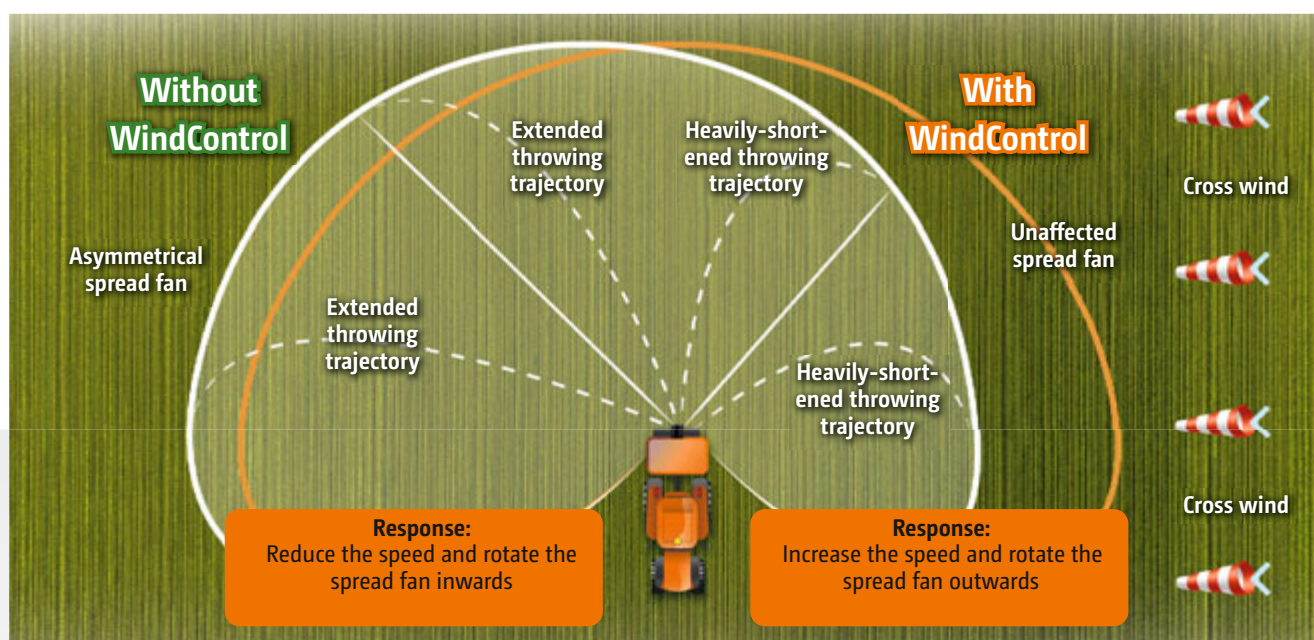
The wind is always blowing somewhere in the world and this makes accurate mineral fertilisation a major challenge in agricultural practice. According to Prof. Dr. Karl Wild of the University of Applied Sciences, Dresden, the influence of wind on the spread pattern can also be constantly monitored and automatically compensated for by WindControl. WindControl can now also be specified for the ZA-TS mounted spreaders and ZG-TS trailed spreaders independent of the ArgusTwin spread fan monitoring system.

The challenge posed by the wind when spreading mineral fertiliser

Winds can be strong or light, blow from different directions or blow at a constant speed one moment and in gusts the next. As a result, the effect of the wind on the spread pattern never stays the same. The wind speed and the wind direction vary both within the tramline and in comparison to the adjacent tramline.

The wind is a parameter in fertiliser spreading which the operator cannot influence directly but they must always keep in mind. As a rule, the key period of use for a centrifugal broadcaster is during the main growing season in spring. At this time of year, the site-related probability of having to work in windy conditions is particularly high when viewed over the year as a whole.

Headwinds or tailwinds stretch or compress the distribution pattern. The lateral distribution is not affected in either case, so that the throwing distance and therefore the effective working width remain unchanged. On the other hand, crosswinds change the lateral distribution significantly. The distribution pattern is compressed on one side and stretched on the other, resulting in an asymmetrical spread pattern. So the task of WindControl is to permanently monitor the spread pattern and adjust the fertiliser spreader settings in such a way that a symmetrical spread pattern is restored.



In addition to all the important parameters for fertiliser spreading, the operator always has an overview of the current wind situation in the work menu



Windless conditions "at the touch of a button" widens the application window

A high-frequency wind sensor, mounted on the fertiliser spreader, records both the wind speed and the wind direction and transmits this information to the job computer. This processes the data with the forward speed and calculates new settings for both the delivery system and the spreading disc speed, which are then automatically adjusted. In a cross wind, the disc speed is increased on the side into the wind and the delivery system is rotated outwards. At the same time, the disc speed is decreased on the side facing away from the wind and the delivery system is turned inwards. This automatically counteracts the wind effect and ensures an accurate distribution. In addition, the use of WindControl results in larger time windows for fertilisation.

An eye on the wind

In addition to all the important parameters for fertiliser spreading, the operator always has an overview of the current wind situation such as the wind direction, wind strength and gustiness in the work menu. Traffic light colours are used to indicate the extent to which WindControl is still able to compensate for the effect of the wind. The system also issues a warning message if the limit to the amount of control is reached when the wind is too strong or if the gusting is changing too frequently.

The mast holding the wind sensor is automatically extended when the spreading discs are actuated. In doing so, the

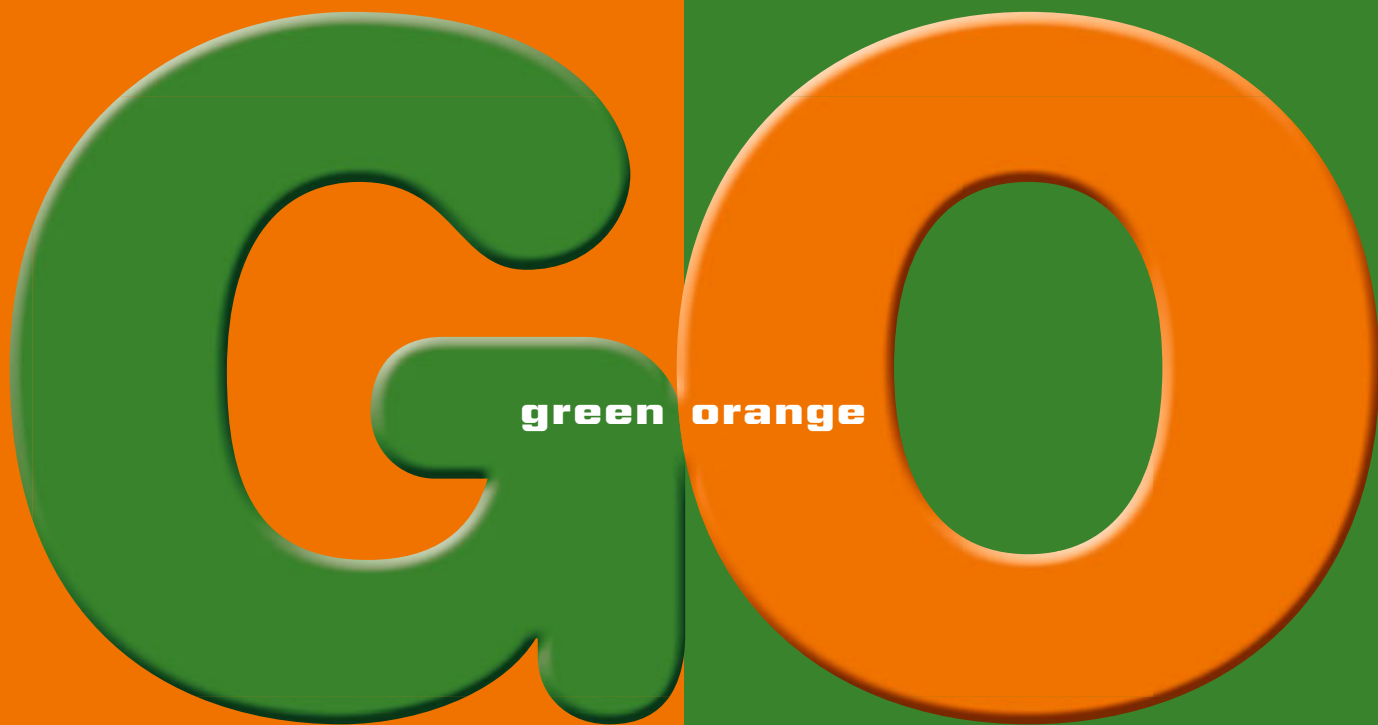
sensor protrudes above the tractor cab so as not to measure any turbulence generated by the tractor. When the spreading discs are switched off, the wind sensor retracts to the protected position between the tractor and the spreader. Manual operation is also possible.

Perfect results in every situation

AMAZONE offers the ArgusTwin spread fan monitoring system for the ZA-TS and ZG-TS centrifugal broadcasters as an addition to WindControl. ArgusTwin enables the spread pattern from both the right and left hand disc to be monitored constantly by 14 radar sensors. If there are any deviations, the lateral distribution is automatically optimised by an adjustment via the electric delivery system. This can be carried out individually for each side, thereby ensuring optimum lateral distribution. ArgusTwin ensures a constant spread pattern even when spreading on slopes, using non-homogeneous spreading materials, or when moisture causes changes to the spreading process.



The settings for the fertiliser spreader are constantly recalculated and automatically adjusted via the high-frequency wind sensor



Innovations in plant protection



SCHMOTZER Venterra 2K hoe

For high performance and high work rates as well as flexible working times



SCHMOTZER





The camera and shift frame provide fully automatic control of the hoe at the rear, thereby relieving the stress on the driver.

The Venterra 2K hoes combine an unrivalled passage with a maximised lift height of the parallelograms of almost 50 cm, which opens up new possibilities for mechanical weed control, even in very late crop growth stages. As a result, damage-free hoeing right to the end is possible for crops with a height of half a metre, even when driving onto the headland, thanks to the interaction with Section Control.

The new design of the parallelograms and the attachment frame enables operation at maximum demand on large acreages as well as a very high working speeds. In combination with the continuing excellent quality of work, the Venterra 2K therefore sets new standards in the hoeing sector.

The Venterra 2K will be available in different versions for the 2022 season. Working widths of 4.5 to 6.75 m can be offered with row widths of 45, 50 and 75 cm in combination with the KPP-L parallelogram and Section Control, or KPP-M with or without Section Control.



The compact design of the Venterra reduces the requisite front ballasting of the tractor. The distance between the rear parallelograms and the lower links has been further reduced.

The Venterra 2K is guided in the row by a camera system, which guarantees precise guidance at all times, even at very high working speeds. This also underlines that the Venterra 2K is biased towards achieving even higher work rates.

Row protection elements and tools such as finger hoes on separately guided parallelograms, ridging discs or rear harrows are optionally available for all Venterra 2Ks and can be retrofitted at any time.

The compact and lightweight design means that there are no losses in yield due to any detrimental soil compaction. Precise working across slopes without tractor offset is easy thanks to the SCHMOTZER parallel shift frame. The work involved in changing the share plates is reduced to a few minutes as a result of the RAPIDO quick-change system. Trailing implements such as finger hoes or ridging discs are mounted on a separate parallelogram with separate depth control and enable direct contour following in all conditions. All hoes are integrated on every parallelogram option with maintenance-free bearings as standard.



Full compatibility with additional front mounted implements, such as the AMAZONE FT-P 1502 front tank as a band sprayer, is built in.



The hydraulic individual parallelogram lifting system enables damage-free hoeing right to the end of the row as well as the largest clearance available on the market.

FT-P 1502 self-contained front tank

The versatile partner in modern crop production!



The FT-P 1502 front tank in work with a SCHMOTZER hoe for band spraying



Operator station of the FT-P 1502 front tank with Comfort-Pack on the left-hand side

AMAZONE has developed the FT-P 1502 self-contained front tank based on the successful technology of the UF 02 crop protection sprayers.

The FT-P 1502 front tank is the ideal partner for any application of liquid products. These include hoes with band sprayers, seed drills with liquid fertiliser equipment and many others.

Large spray agent tank and high-capacity pump

The FT-P 1502 front tank with a nominal volume of 1,500 l (actual volume 1,660 l) is equipped with a hydraulically-driven 180 l/min piston diaphragm pump for self-contained use. The oil requirement for operating the pump is 35 l/min.

Simple, intelligent operation with the SmartCenter

The operator station of the FT-P 1502 front tank is positioned on the left-hand side and is easily accessible. The operator station can be equipped with the familiar Comfort-Pack of the UF 02 as an option. This includes the TwinTerminal 3.0 for operating the suction side, an automatic fill stop for suction filling, fill level dependent, auto-dynamic agitator regulation and remotely controlled, automatic cleaning programs for quick and thorough cleaning. The FT-P 1502 front tank is equipped with a 180 l fresh water tank that enables efficient cleaning.

Safe and precise metering of plant protection agents and other additives is guaranteed by the large induction device under the large easy-to-open dome cover. The additional step on the large folding platform in front of the spray



Hydraulic pump drive, with a safety valve to prevent over-reving and incorrect hose connection to the tractor



Folding platform with access step for safe introduction of supplementary products



Fill opening in the tank dome with extra-long canister rinse nozzle for optimum cleaning results



Removable sieve for an unobstructed view into the tank

agent tank makes the induction device very easy to reach. The induction device includes a cleaning pistol, a canister rinse nozzle with a dead man's handle and a removable stainless steel sieve as standard. The taps for operating the cleaning pistol and the canister rinse nozzle are located directly by the dome cover and are easily accessible. In addition, a storage facility is integrated in the operator station on the tank dome.

Gloves and other items can be safely stored in the dust- and splash-proof, lockable storage compartment on the right-hand side. A hand wash tank with an integrated soap dispenser is located directly beside this.

More safety on the road

The front tank is equipped with marker boards and integrated LED front lights as standard for road use. A TÜV-approved certified camera system, LED work lights and additional ballasting are available as options.

Precise, easy to operate and flexible in use with ISOBUS control

The application rate is controlled and regulated via independent ISOBUS control of the FT-P 1502 front tank. The ISOBUS control regulates the metering depending on the forward speed. Other functions such as automatic part-width section control or part-area, site-specific application can also be implemented. The ISOBUS terminal can also be used for the complete job management and documentation.



Lockable storage compartment and hand wash tank with integrated soap dispenser on the right-hand side of the machine



Fill level indicator clearly visible from the tractor



Part-width valve chest on the SCHMOTZER Ventera 2K hoe



Interface between the FT-P 1502 front tank and part-width valve chest on the attached implement

Part-width valve chest interface

A part-width valve chest with 2 to 6 part-width sections can be fixed on to any connected implement. The attached implement can be disconnected via a joining socket on the front of the valve chest leaving the part-width valve chest fixed to the machine. This always remains with the implement when the implement is changed. This means that any attached implements can be changed quickly and easily. The working range of the FT-P 1502 front tank covers an application rate of 5 to 100 l/min at a working pressure of 2.0 to 8.0 bar.

Applications for the self-contained front tank:

- ✔ Band spraying in conjunction with a SCHMOTZER hoe
- ✔ Liquid fertilisation during seeding with the Precea or Primera DMC
- ✔ Application of bio-stimulants during sowing or when stubble cultivating
- ✔ Other individual applications

The advantages at a glance:

- ✔ Simple intuitive operation and cleaning as well as maximum comfort
- ✔ Compact design for optimum visibility
- ✔ Comfortable induction of supplementary products via the tank dome
- ✔ Precise metering via independent ISOBUS control with forward speed-related rate regulation and part-width section control, with automatic part-width section control and part-area, site-specific metering as an option
- ✔ Maximum flexibility enables a large number of uses
- ✔ Year-round, universal and flexible use in combination with various implements thanks to the autonomous control system
- ✔ Optimised functionality for special applications:
 - Application of plant protection agents in combination with a hoe or
 - liquid fertilisation during sowing with a Primera DMC, precision sowing with a Precea or carrying out soil tillage with a Cenius cultivator

AMAZONE UX SmartSprayer

Spot Farming at the highest level now in field use



SmartSprayer in use on sugar beet

Video of UX SmartSprayer in field use:
www.amazone.net/yt-smartsprayer





SmartSprayer – a joint project from Bosch, xarvio™ and AMAZONE

AMAZONE started practical field trials of the UX 5201 SmartSprayer trailed sprayer with its 36 metre boom during the spring season 2021. The pinpoint application of foliar herbicides is carried out "green in green" in real time during the day-to-day spraying activities of a large arable farm.

SmartSprayer technology for more sustainability

The camera technology from Bosch detects weeds in row crops and the xarvio™ agronomic decision-making engine (ADE) from BASF Digital Farming Solutions decides on the application. Full-area application of soil-contacting herbicides from an additional tank is also possible on the same pass with a twin line system.

Successful field use

Field trials to date show that the use of this technology reduces herbicide use by up to 90 % in individual treatments, depending on the weed pressure and field conditions. Extensive field trials this year in sugar beet, maize and rape will further qualify the benefits of this technology.

A new generation of booms

The newly developed high-tech sprayer boom has the camera and lighting modules integrated in such a way that they are ready for field use and ensures precise spot application via the ContourControl active boom guidance system and the SwingStop active vibration damping system, which is unique



Active light source for accurate weed detection by day and night



Boom end with integrated break back protection



Extremely small application zones

on the market. The combination of individually switched pulse width frequency modulation (PWFM) valves and specially coordinated agrotop spot fan nozzles at a 25 cm nozzle spacing ensures precise spot application and maximum saving potential at working speeds of up to 12 km/h.

Exact image recognition Bosch's image recognition system detects any weeds in milliseconds at a very early growth stage, in order to apply herbicides to the target surface with high precision and efficacy. The specially developed LED lighting technology provides support in difficult ambient conditions such as with shadows and, of course, at night. Another advantage of the integrated SmartSprayer solution is its superiority over satellites and drones, as plants are detected to pinpoint accuracy, making real-time applications possible.

xarvio™ agronomic decision-making engine

The best field-specific setting and the recommended herbicide mixture for the SmartSprayer system and when they should be used are based on the advanced xarvio™ agronomic decision-making engine (ADE) from BASF Digital Farming. Various parameters such as cropping, weed spectrum and weather conditions, are automatically taken from xarvio™ FIELD MANAGER, processed to create a decision and transferred to the SmartSpraying system in line with good agricultural practice of integrated plant protection. This ensures that the herbicide application is carried out at the right place, the right time and at the right intensity.

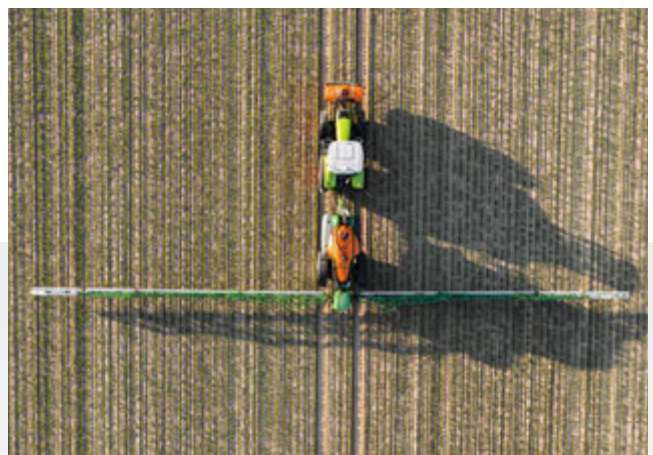
A look at the future

Together with Bosch and BASF Digital Farming, AMAZONE has carried out a wide range of research activities and implemented them in a marketable product with its interdisciplinary know-how. The gradual market introduction of this pioneering SmartSprayer technology, which is unique worldwide in its technical possibilities and system approach, will take place in the coming years.

The advantages at a glance:

- ✔ Instructions for action are based on the enormous volume of data held by the xarvio decision-making engine
- ✔ Real-time system with extremely small application zones
- ✔ Maximum precision even at large boom widths in conjunction with active boom guidance and active swing damping
- ✔ Technology ready for practical use
- ✔ Enormous potential for savings on plant protection agents

SmartSprayer with 36 m boom





Spot application via the spot nozzle bodies



Combination of full-surface application and spot application at night

UX 7601 Super and UX 8601 Super trailed sprayers

Maximum output in a most compact and most manoeuvrable form!



Equipped with all the innovative, future-proof AMAZONE crop protection technology, the new AMAZONE UX 7601 Super and UX 8601 Super trailed sprayers stand for the highest precision, performance and economy in operation



UX 7601 Super with 42 m Super-L3 boom in the transport position



UX 8601 Super with 36 m Super-L3 boom

The completely newly developed UX 7601 Super with an actual volume of 8,000 l and UX 8601 Super with an actual volume of 9,000 l provide maximum tank capacity on one axle. They feature compact overall dimensions with an extremely low centre of gravity for optimum stability and a low weight and high payload.

The frame – Super-stable and elastic

The UX 7601 Super and UX 8601 Super feature a completely newly developed frame which leads directly from the axle to the standardly equipped, lower hitch drawbar. The forward-sloping frame shape enables ideal weight distribution of the sprayer – permissible drawbar loads and axle loads are optimally utilised. The centre of gravity is very low due to the new frame profile, ensuring unrivalled stability on slopes and when cornering. The narrow profile of the spray agent tank

with the fresh water tanks mounted on either side of the frame also contributes to its excellent stability under all conditions. The machines have a comparatively low weight thanks to the one-piece frame without a separate drawbar. The maximum permissible total weight is 14 t.

Axles – stay on track at all times

Depending on customer requirements, the UX 7601 Super and UX 8601 Super can be equipped with a rigid or steered axle (up to 28° steering angle) for true track following. Due to the compact design, the sprayer is easily manoeuvrable despite the tank capacity, and there is no difference in handling compared with the smaller model sizes. The axle is unsprung as standard, but a hydro-pneumatic axle suspension is available as an option.



UX 7601 Super with a one-piece chassis without a separate drawbar for an extremely low centre of gravity



UX 8601 Super with hydro-pneumatic axle suspension and underbelly cover that provides an absolutely plant-friendly underside of the sprayer



Narrow tank – Rounded design

As in the case of the UX 4201 Super, 5201 Super and 6201 Super, the tanks all are made of polyethylene. The big advantage here is the generally very rounded form, inside and outside of the tank. Along with the absolutely smooth inner and outer walls of the spray agent tank, the sprayer is very easy to clean. The clever geometry of the tank means that there are no annoying nooks and crannies which are more difficult to clean. The narrow profile of the spray agent tank enhances stability when the tank is partially filled. For example, the liquid cannot slosh around so much when cornering or on a slope, thereby ensuring absolutely safe driving stability, even with a partially filled tank.



Safe access to the tank opening via the large platform

High-capacity pumps without compromise

The new UX models are equipped with a 250 l/min spraying pump and a 350 l/min agitation pump as standard, both of which are piston diaphragm pumps. The dedicated agitation pump ensures sufficient agitation intensity with these larger tank capacities. The technology behind these piston diaphragm pumps enables consistently high delivery capacities, regardless of the spray pressure. The agitation intensity and application rate are always consistently high, regardless of whether the spray pressure is 2 or 8 bar. In addition, the piston diaphragm pumps are self-priming, which means that the complete spray agent circuit is a very simple set up and with the shortest possible hose routing. Apart from the spray agent tank, this also provides a solid foundation for fast and thorough cleaning. The newly developed pump generation has larger piston diameters which require a shorter stroke for the same transfer capacity. This means that the diaphragms are subjected to less mechanical stress. The service life is thereby significantly increased and the amount of maintenance work reduced. Depending on the customer requirement, the spray agent and agitator pumps can either be mechanically driven by a



Newly developed piston diaphragm pumps with hydraulic drive



Excellent road holding, also when negotiating bends, as a result of the extremely low centre of gravity

PTO shaft or hydraulically. The hydraulic pump drive, which is fully integrated in the ISOBUS control, regulates the required pump speed fully automatically depending on the operating status.

Maximum performance with HighFlow⁺

Both of the new UX models can be equipped with the optional HighFlow⁺ system so as to maximise work rates at the wider boom widths by means of higher working speeds and yet still guaranteeing effective application by maintaining an adequate water spray rate. The intelligent control technology enables both pumps to be used for spraying while maintaining a high agitation intensity. Despite the enormous application rates of 400 l/min, the machine always has sufficient agitation capacity available to maintain a homogeneous spray agent, thanks to the intelligent control technology. All components of the HighFlow⁺ system are completely integrated into the cleaning cycle.



Operator station with Comfort-Pack

Maximum operating comfort via the SmartCenter

The UX 7601 Super and UX 8601 Super are operated via the SmartCenter, which is concealed under the large, one-piece cover on the left-hand side. All machines feature a 60 l induction bowl with a rinse ring, canister rinse nozzle, mixing nozzle for the effective induction of powdery granules, spray lance, tank cover with large storage space and a function for cleaning the induction bowl with the lid closed.

Three levels of operating system are available for the SmartCenter: In addition to the completely manually operated Standard-Pack, the Comfort-Pack with TwinTerminal 3.0 complete with automatic fill stop for suction and bows-er filling, remotely controlled cleaning programs and fill level dependent, auto-dynamic agitator regulation is available. The most convenient solution is the Comfort-Pack plus with a pressure-sensitive touch terminal for machine operation with fully automated filling and cleaning processes.

The advantages at a glance:

- ✔ Maximum tank capacity allowable on one axle
- ✔ Optimum weight distribution
- ✔ Low centre of gravity for maximum stability
- ✔ Compact and manoeuvrable
- ✔ Low weight for maximum payload
- ✔ High output yet easy to operate

Super-L3 boom from 39 m to 42 m

Ultra-robust and smooth boom ride with large working widths



UX 7601 Super with 42 m Super-L3 boom



Hydraulically-pressurised break back on the 42 m Super-L3 boom



Hydraulic pre-tensioning of the boom end

AMAZONE has designed the Super-L3 boom for high demands and large working widths together with an absolutely smooth boom ride. In doing so, AMAZONE remained true to its usual boom construction philosophy: A clever aircraft wing design makes the construction super-light yet super-strong.

Boom widths up to 42 m working width

In addition to the familiar Super-L3 booms up to 36 m, wider versions for 39 m, 40 m and 42 m working widths are now also available. The boom can also work with a reduced width with pivot points at 12 m, 24 m and 33 m. The 42 m boom can also be folded to 40 m or 39 m with an optional reduction joint on the boom end sections. The 39 m boom can be reduced e.g. to 36 m by means of this optional equipment. One-sided independent folding up to the inner boom section for negotiating obstacles is also possible. A flexibility of working widths and one-sided independent boom folding which is only available from AMAZONE.

Extensive optional equipment

The wide structural design of the carriers and profiles ensures a high rigidity and load-bearing capacity of the boom. The hydraulically-pressurised break back joints always keep

the boom end steady but release safely in the event of collision with obstacles and then bring the boom quickly back into position. All in all, an absolutely smooth boom ride is obtained under all conditions. The special feature: thanks to the special folding system integrated in the implement, the boom is extremely compact when it is in the transport position and does not protrude forwards beyond the sprayer. In addition, the new Super-L3 boom variants in working widths of 39 m to 42 m are equipped with the ContourControl active boom guidance system and the SwingStop active vibration damping system as standard.

The advantages at a glance:

- ✔ Ultra-robust to cope with the stress caused by operating at high speeds and at maximum work rates
- ✔ Very smooth boom ride even under extreme conditions
- ✔ One-sided independent folding
- ✔ Hydraulically-pressurised break back joints for safe release in the event of encountering any obstacles
- ✔ Equipped with the ContourControl active boom guidance system and the SwingStop active vibration damping system as standard
- ✔ Precise maintenance of the distance to the target surface for a perfect application result



42 m working width compactly folded for safe road transport



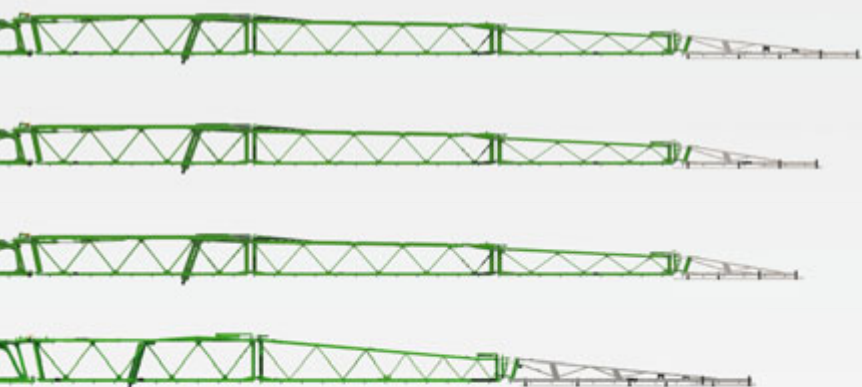
UX 7601 Super with 42 m Super-L3 boom and UX 5201 with 36 m Super-L3 boom

Working widths of the Super-L3 boom





UX 7601 Super with 42 m Super-L3 boom: Precise boom guidance thanks to ContourControl and SwingStop



DirectInject direct feed system

Quick, flexible and needs-based metered addition of plant protection agents



DirectInject equipment with 50 l tank and pump unit in the storage compartment of the UX 01 Super



Activation of DirectInject in the AmaTron 4 terminal

The demands on farmers and technology are constantly increasing with regard to plant protection. Flexibility in the selection of plant protection agents in the field becomes an increasingly important point here. From a plant establishment perspective, the needs-based application of specific products and active ingredients only in sections or on individual fields is a frequent response. There are also restrictions relating to environmentally-sensitive fields and bodies of water which the farmer must consider when selecting the plant protection agents. These requirements with respect to flexibility in plant protection are in stark contrast to the structural development towards larger sprayers for high work rates and economic use.

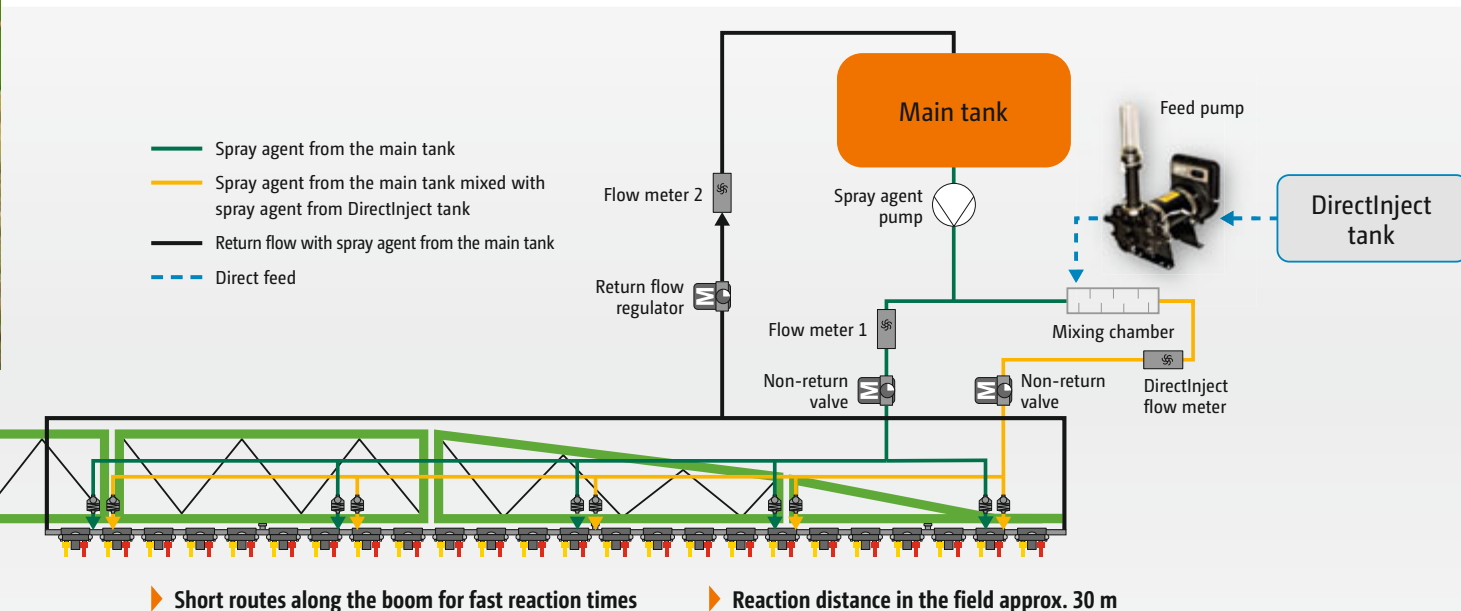
System overview

The DirectInject system has enabled AMAZONE to offer a system for the direct injection of plant protection agents which solves, for the first time, the conflicting goals described above. Plant protection agents can be injected or

stopped during application as required. The special feature of DirectInject compared to conventional systems is the fast response time of the injection process and its complete integration into the spray agent circuit and operation of the sprayer.

With DirectInject, it is possible to respond individually to the needs of the crop on the field and reduce the use of plant protection agents and the number of additional passes with the sprayer. This saves time, money and protects the environment.

DirectInject consists of an additional 50 l tank with its own metering system, which is integrated into the storage compartment of the UX 01 Super on the right-hand side of the machine. This means that the tank is also easily accessible from the ground and can be filled safely. The integration of these components into the storage compartment also provides optimum protection for all the equipment.





DirectInject tank with integrated sieve for easy and safe filling



Mechanical agitator and cleaning nozzle in the DirectInject tank

The major advantage of the technology is that DirectInject can work with undiluted plant protection agents. A mechanical agitator ensures that even plant protection agents which tend to separate remain homogeneous.

Application in the field

If the driver of the sprayer notices, for instance, a prevalence of unwanted weeds that need to be controlled in a specific part-area, he or she can activate the metering of DirectInject from the cab at the touch of a button. The supplementary product from the DirectInject tank is then added to the spray agent from the spray agent tank. The optimised reaction time compared to conventional systems is achieved by a twin-line system. Pre-mixed spray agent

from the spray agent tank and the plant protection agent from the DirectInject tank are held in a second spray line in the boom. When the direct feed system is activated, the mixture is applied through the nozzle bodies and nozzles via several injection points in the boom. These short routes for the spray agent directly in the boom result in short reaction times in the field. The DUS pro high-pressure recirculation system enables the spray agent in the spray line to circulate with the pre-set spray pressure at all times, even when the nozzles are closed. Circulation is stopped when the direct feed system is activated, meaning that the spray agent from the spray agent tank is not mixed with the product from the DirectInject tank.



The boom has two separate supply lines, yellow and green, which are switched remotely



Exact input of the added quantity

Residual spray volumes and cleaning

Since DirectInject can work with undiluted plant protection agents, unused quantities can be returned to the original container of the product after application. As a result, the amount of plant protection agent actually needed does not have to be known before application, nor do mixed residual amounts have to be dealt with afterwards.

The entire system can be cleaned automatically and remotely from the tractor cab after application. All components are integrated in Comfort-Pack on the sprayer for this purpose. This gives the user security and saves time.

Farmers who use DirectInject report that they can now react much more flexibly to individual fields and part areas with respect to plant protection. Where differentiated, immediate applications were otherwise not possible, they can now react to the situation in the field in just one pass. Time saved, a reduction in the use of plant protection agents and optimum crops are the result.

The DirectInject direct feed system can be used with the UX 01 single-axle crop protection sprayers with standard ISO-BUS communication and AmaSwitch or AmaSelect single nozzle control with DUS pro high-pressure recirculation system.

The advantages at a glance:

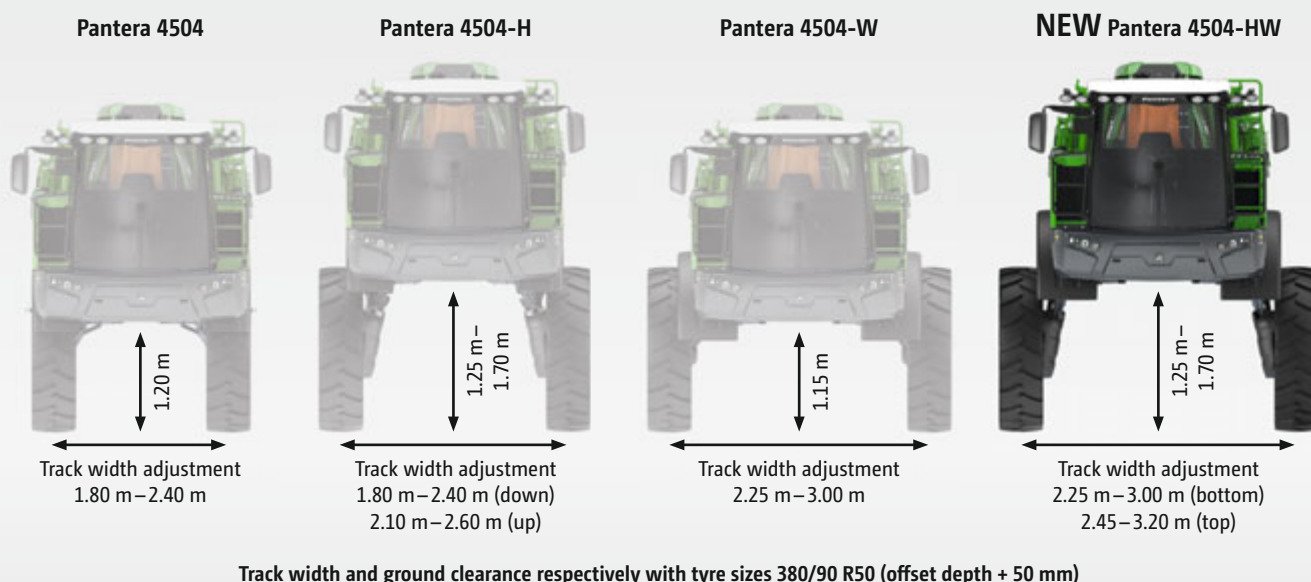
- ✔ Flexible, fast and needs-based use of plant protection agents
- ✔ Saving of:
 - Working time and labour costs
 - Machine costs
 - Plant protection agents
- ✔ Optimum crops
- ✔ Environmentally-friendly

Pantera 4504-HW self-propelled sprayer with Comfort-Pack plus

Higher and wider with tremendous stability and maximum operating comfort



Pantera 4504-HW with SunflowerKit



The Pantera self-propelled sprayer is now available with the new high-clearance chassis, which allows flexible, hydraulic adjustment of both the ground clearance and the track width.

Maximum flexibility

The Pantera-HW self-propelled field sprayer is extremely versatile with a track width adjustment range of:

- 2.25 m to 3 m with a ground clearance of 1.25 m or
- 2.45 m to 3.2 m (maximum 3.3 m) with a ground clearance of 1.7 m.

In spite of its higher centre of gravity, the Pantera 4504-HW turns out to be very stable and can be flexibly used in a wide variety of crops and row spacings. In particular, contractors looking to offer a flexible plant protection service across a wide range of customers and crops can clearly increase the scope of crop protection treatments possible.

Better protection for both machine and plants

In addition to the standard drive wheel motor guards with additional drive wheel gearbox covers, crop dividers and the underbelly cover, AMAZONE offers three more optional extras on the Pantera-HW for optimum protection of the crop.



Pantera 4504-HW



Drive wheel motor guard on the Pantera 4504-HW



Drive wheel gearbox cover and crop divider on the Pantera 4504-HW



Pantera 4504-HW with lift module

Crop-saving SunflowerKit

The SunflowerKit was specially developed for the Pantera-HW, in order to be able to carry out plant protection and fertiliser applications in tall sunflower crops without causing excessive plant damage. The kit consists of crop dividers, wheel housings and a shaped, flexible underbelly sheet. The crop dividers precisely separate the plants between the rows directly in front of the tyres. Thanks to the profile of the underbelly sheet and the properties of the flexible material, the sunflowers gently slide under the machine without hindrance.

Flying high with the lifting module

The optional lift module 700 can be used to raise the Super-L2 boom by a further 70 cm. When used with this lift module, the Pantera-HW has an application height of 3.85 m, measured from the lower edge of the nozzle.

The advantages at a glance:

- ✔ Angled lifting cylinders provide tremendous stability
- ✔ Larger track width in combination with the high-clearance chassis for maximum flexibility
- ✔ Large clearance under the machine
- ✔ An application height of up to 3.85 m with the lift module



Pantera 4504-HW in action in a Hungarian sunflower crop



Comfort-Pack plus for operation with maximum comfort



TwinTerminal 7.0 can be operated with gloves without any problems

SmartCenter with Comfort-Pack plus for maximum comfort

Handling is made especially comfortable by Comfort-Pack plus. Instead of operating taps, TwinTerminal 7.0 makes machine operation much easier with its pressure-sensitive touchscreen. The spray agent circuit is completely controlled solely via the touchscreen of the secondary terminal, which functions perfectly even when wearing gloves. The user just selects the desired function and the sprayer adjusts itself automatically!

In the job computer, two individual filling profiles for different operators or applications can be stored. For filling then just the hose has to be coupled and the machine automatically fills the spray agent tank and fresh water rinse tank up to the desired tank fill level. As an option, the operator can select an individually adjustable pause in the filling of the spray agent tank.

Automatic and independent cleaning

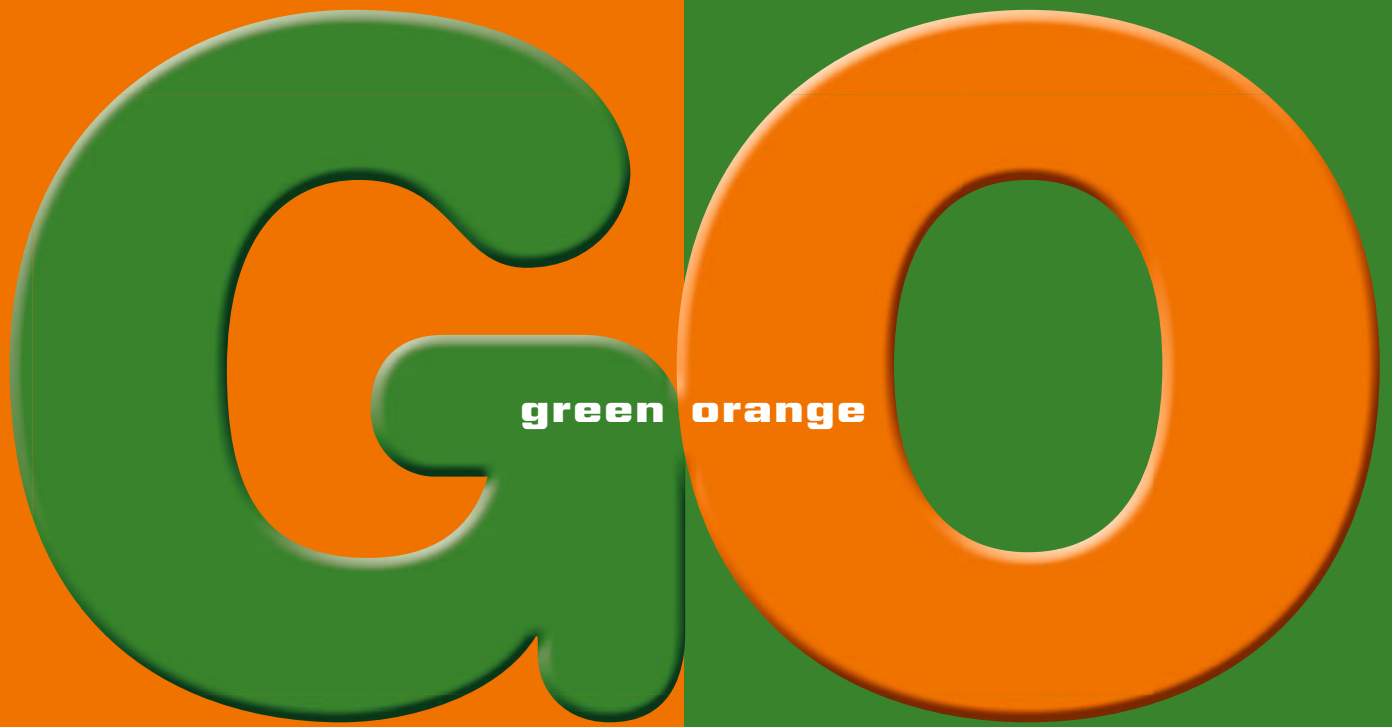
The complete sprayer along with the induction bowl can be cleaned fully automatically. For this purpose, the Pantera with Comfort-Pack plus is equipped with the following cleaning programs: intensive clean, quick clean and boom rinsing. In addition, after every fill, the induction bowl rinses itself on its own.

High-capacity fresh water pump

Comfort-Pack plus includes a fresh water pump with an output capacity of 160 l/min. This can be used to supply the induction bowl with fresh water from the fresh water tank during bowser filling. The fresh water pump can be used to fill the fresh water tank and the spray agent tank in parallel via the suction port. The additional fresh water pump also enables faster cleaning of the Pantera.

The advantages at a glance:

- ✔ Simple operation: select the function and the Pantera adjusts everything fully automatically
- ✔ Maximum comfort: automatic filling and automatic fill stop for both suction and bowser filling
- ✔ Maximum safety: fully automatic cleaning of the entire machine including the induction bowl
- ✔ Maximum performance: automatic quick fill via the venturi after induction
- ✔ Auto-dynamic agitation control



Innovations in electronics

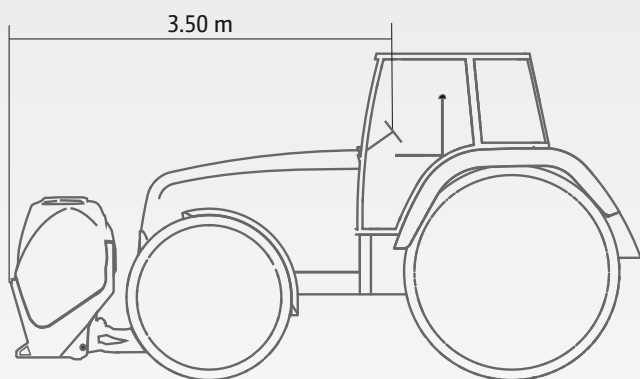


Certified camera system for monitoring cross traffic

Safe and clear driving with the FTender front mounted transfer hopper or FT front tank



The certified camera system on the FTender 1600 front mounted implement (without T-Pack F front tyre packer) ensures safety on the road



In Germany, an escort must be taken along or a certified camera monitor system must be used if the distance from the centre of the tractor steering wheel to the front edge of the front mounted implement exceeds 3.50 m.

AMAZONE offers a solution for the FTender 1600 (without T-Pack F front tyre packer), the FT 1001 and FT 1502 front tanks and the self-contained FT-P 1502 front tank in the shape of the DLG-certified front camera monitor system. This enables safe use in road traffic despite the large dimensions of these front mounted implements.

The legal situation in Germany

Tractors with a front mounted implement which exceed a combined front dimension (distance from the centre of the steering wheel to the front edge of the front mounted implement) of more than 3.50 m have a highly restricted field of vision. This must be compensated for by suitable meas-

ures, in order not to pose a danger to other road users at blind field exits, yard exits and road junctions. This is regulated in the "Code of practice for mounted implements" with reference to the applicable StVZO [Road Traffic Licensing Regulations], and the use of an escort provided a practical solution in the past.

Options for dispensing with an escort are included in the draft of the German Transport Gazette on the use of certified camera-monitor systems for cross-traffic observation, which is ready for publication. The camera system from AMAZONE already meets the relevant requirements.



The certified camera monitor system on the FT-P 1502 front mounted implement provides an optimum view of cross traffic without risky approaches to footpaths, cycle paths and road traffic.



The cameras installed on the left and right of the front mounted implement make cross traffic visible at all times via the split monitor screen.

Certified camera monitor system for a better overview and increased safety

Up to now, AMAZONE has offered a camera system which can be used on front mounted implements for cross-traffic monitoring, but it will not be possible to use it to replace the escort. In practice, this represents a significant expense and a permanent risk, as taking an additional person along as an escort requires a great deal of planning and cannot always be ensured.

A DLG-certified camera system from AMAZONE is now available in Germany as an option for the FTender 1600 front tank without a T-Pack F front tyre packer as well as for the FT 1001, FT 1502 and FT-P 1502 front tanks. An installation report from an officially recognised expert is also required for this certified camera system. The installation of the camera system in conjunction with the tractor and the front mounted implement is checked in this appraisal. The two cameras are already pre-mounted on the left and right of the front mounted implement in conformance with the regulations and transmit their camera image to a clear monitor in the tractor cab without impairing the direct vision of the driver. A split screen allows parallel viewing of the left and right cameras. The camera system can be coupled or uncoupled together with the front mounted implement via a plug for quick and uncomplicated use.

No restricted visibility at crossroads or field exits

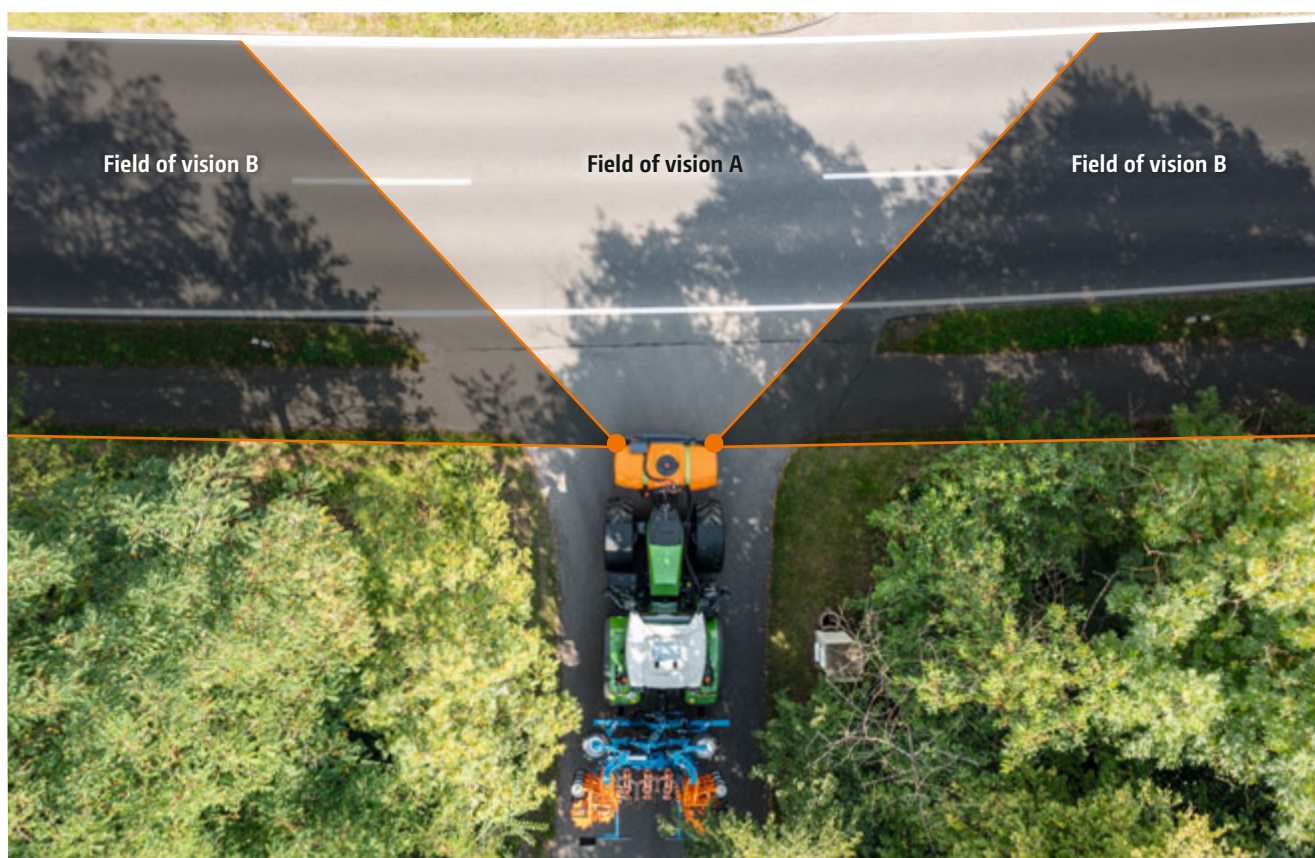
The new certified camera system from AMAZONE enables optimum monitoring of cross traffic when exiting fields or yards where the view is obscured. The driver therefore has a clear view of the traffic, which significantly reduces the risk of accidents in areas where visibility is poor. The use of the certified camera monitor system not only means that road safety is increased but that the dangers for the driver in moving traffic are also significantly reduced.

The advantages at a glance:

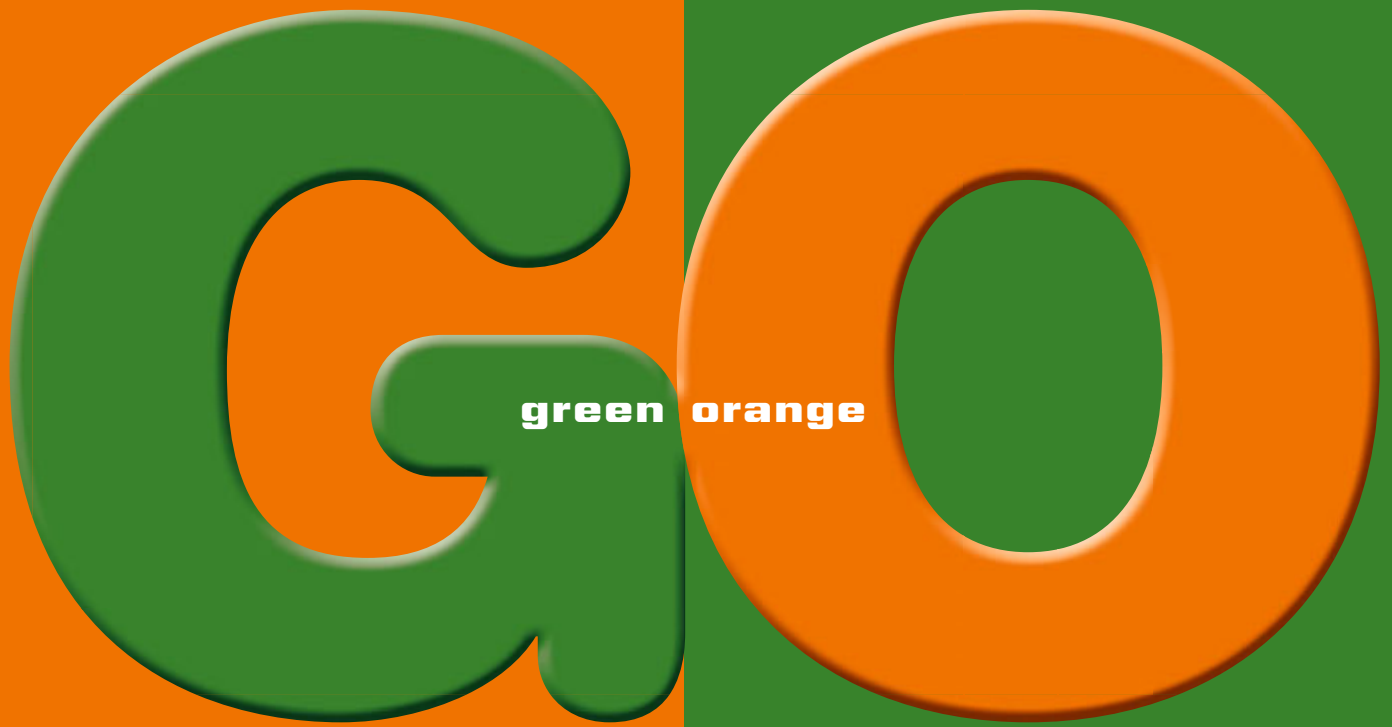
- ✔ DLG-certified and approvable
- ✔ No additional person required as an escort
- ✔ Safe driving on the road due to the visibility of cross traffic
- ✔ The risk of accidents in areas with poor visibility is reduced
- ✔ Sealed, waterproof and dustproof

FTender 1600 front tank
with certified camera system





The lateral field of vision can be covered by the use of devices for indirect vision (**Field of vision B**), e.g. a camera monitor system, in combination with the driver's direct vision (**Field of vision A**).



Innovations in robotics



Autonomous agricultural machinery, precision technologies and Controlled Row Farming

AMAZONE leads the way!



FarmDroid field robot with AMAZONE SpotSpraying

FARMDROID



Maizerati of the Osnabrück University of Applied Sciences wins Field Robot Event 2002



A world leader with the BoniRob field robot since 2008

The BoniRob as the basis for autonomy at AMAZONE

For AMAZONEN-WERKE, the topic of autonomous agricultural machinery has been at the forefront ever since the **BoniRob** project was launched together with the Osnabrück University of Applied Sciences and Robert Bosch GmbH in 2008 (project funded by the Federal Ministry of Food and Agriculture (BMEL)). The BoniRob field robot was a milestone in robotics and way ahead of its time. Many technological and legal questions still had to be clarified and a market was not yet foreseeable. The BoniRob is still in use today in various research projects at the Osnabrück University of Applied Sciences. This includes the Agro Northwest trial site at the BMEL.

Successful cooperation with FarmDroid, the Danish robot start-up

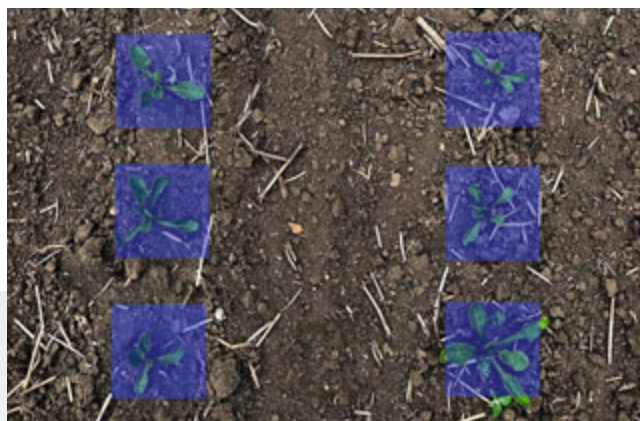
The **FarmDroid FD20** was developed by Kristian and Jens Warming and has become one of the most successful field robots in Europe in just a few years. This success is based on high-precision sowing followed by hoeing between and especially in the rows. The FarmDroid FD20 leads to clear

economic advantages in organic sugar beet establishment and vegetable cropping by greatly reducing the costs of the many workers required for manual hoeing. The aim is to be able to reduce the use of herbicides (and insecticides) to a minimum in future by using the highly automated, solar-powered FD20 sowing and hoeing robot along with a special spot spraying method. Initial trials are currently underway on a trial site field at Südzucker's experimental farm in Kirschgartshausen near Mannheim, Germany.

AMAZONE has further developed the FarmDroid FD20 into a high-precision, spot spraying device. It was shown in the trial project with the partner company Südzucker AG that sugar beet can be grown with a 90 percent reduction in herbicide usage. For AMAZONE, this project was another step towards the further development of automated technologies and to broadening its understanding of the market potential in field robots.



The FarmDroid FD20 robot is equipped with a GPS seeding system, a hoe and the innovative AMAZONE precision spraying system for spot applications



AMAZONE uses the precise position of the beet stored from the GPS sowing system for spot applications



The Cenio three-row mounted cultivator on the AgXeed field robot

New precision technologies for conventional cultivation

There are some promising concepts for the years ahead which reflect the current conditions of conventional sugar beet establishment. Band spraying integrated into the hoe or intermittent band spraying with AmaSelect Row single nozzle control. The UX SmartSprayer trailed field sprayer has a great chance of achieving market acceptance in the larger units: see the chapter on the AMAZONE UX SmartSprayer.

Partnership with AgXeed for the establishment of autonomous processes

In addition to the specialised field robots such as BoniRob or FarmDroid FD20, the autonomisation of typical draught work in the field is a promising topic for the future. In this respect, the autonomisation of the connected implements

and, above all, of the work processes in the implements is the key development issue for AMAZONE. In contrast, the autonomous tractor is better left in the hands of the tractor manufacturers or specialised start-ups. As of this year, AMAZONE has been cooperating with **AgXeed**, a start-up from the Netherlands. In AMAZONE's view, AgXeed's experienced team of developers has chosen the right technological and systemic approaches. The key issue for AgXeed is the commitment to open, standardised interfaces both in the mechanical coupling of machines and in communication via ISOBUS, other standards such as TIM, as well as interfaces which are yet to follow, particularly with regard to electrification and safety. Ultimately, the customer should have the freedom of choice for the best implement on the best tractor unit, which is normally the case today and produces the greatest innovative power.



The AgBot from AgXeed with an output capacity of 156 hp and a conventional 3-point linkage



Harvesting the field trials for Controlled Row Farming

From automation to autonomisation

Automation and monitoring must be perfected, in order to be able to use implements without human supervision. AMAZONE has been pursuing the automation of processes in the machine for many years. Examples of this include the Comfort-Pack plus automatic cleaning system in the sprayers, monitoring of the spreading quality with ArgusTwin or the AutoPoint system for the precise switching of seed drills at the headland.

It is not yet clear which machines will be the first to take the step from automation to autonomisation. Apart from the technical and legal challenges, the primary question concerns the customer segment in which an economic advantage will become apparent.

Autonomy in the Controlled Row Farming system

In 2020, AMAZONEN-WERKE started new long-term field trials together with its subsidiary SCHMOTZER Hacktechnik and its partner Agravis. The Controlled Row Farming (CRF) trials at the new AMAZONE test centre in Wambergen, in the direct vicinity of the production site and main plant in Hasbergen-Gaste, will contribute important findings to new crop production methods in the coming years. With a fixed row width of 50 cm in all crops, the sensitive inputs of fertiliser and plant protection are reduced through precise placement. An additional goal is to increase biodiversity in the field and to keep the economic success of the farm at least constant. The first harvest results confirm a constant yield, also in cereals in a double row with a spacing of 50 cm. The results can also be found at www.controlled-row-farming.de.



Field beans in a double row



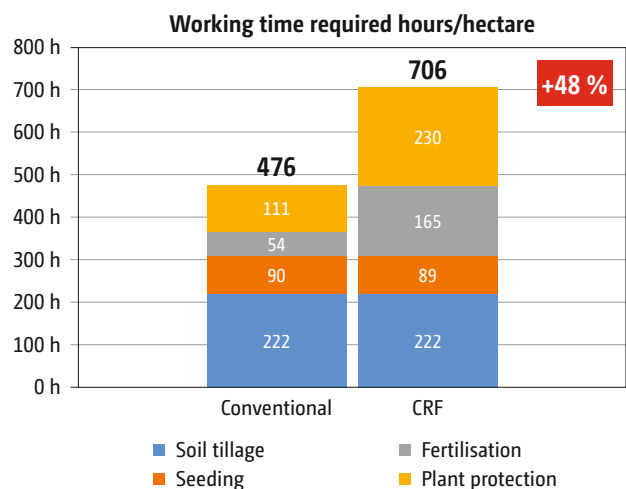
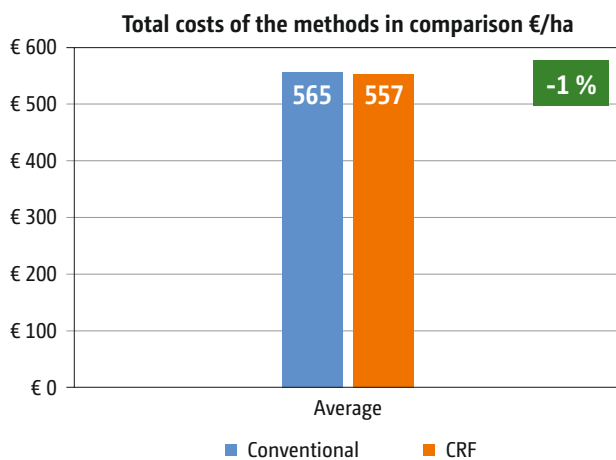
Cereals in a double row with a spacing of 50 cm

In an illustrative economic analysis of the CRF system for a farm with 300 ha, it becomes clear that the reduced costs for the inputs are offset by the increased costs for labour.

Apart from the purely economic consideration, the additional work time required in the main season is a critical point: 476 hours/ha are required for fertilisation and plant protection in conventional arable farming compared with 706 hours/ha (+ 48 %) in the CRF system. In times of a shortage of skilled labour, this factor is critical in the short term. Autonomous agricultural machinery in the CRF system could undertake the labour-intensive tasks for the farmer in the medium to long term. The clear structure in the track guidance and cultivation system suits the robotic systems in any case.

Today, the CRF system is operated with conventional RTK-guided tractors, intelligent connected implements and an attentive driver. It is easy to imagine the use of autonomous field robots for this in the future. Every step of the process would be closely monitored. Slower speeds with smaller working widths and completion of the tasks with even more precision are then also conceivable. Ultimately, the farm manager will have to spend less time monitoring standardised work processes and be able to concentrate on other tasks.

Total costs and total time required

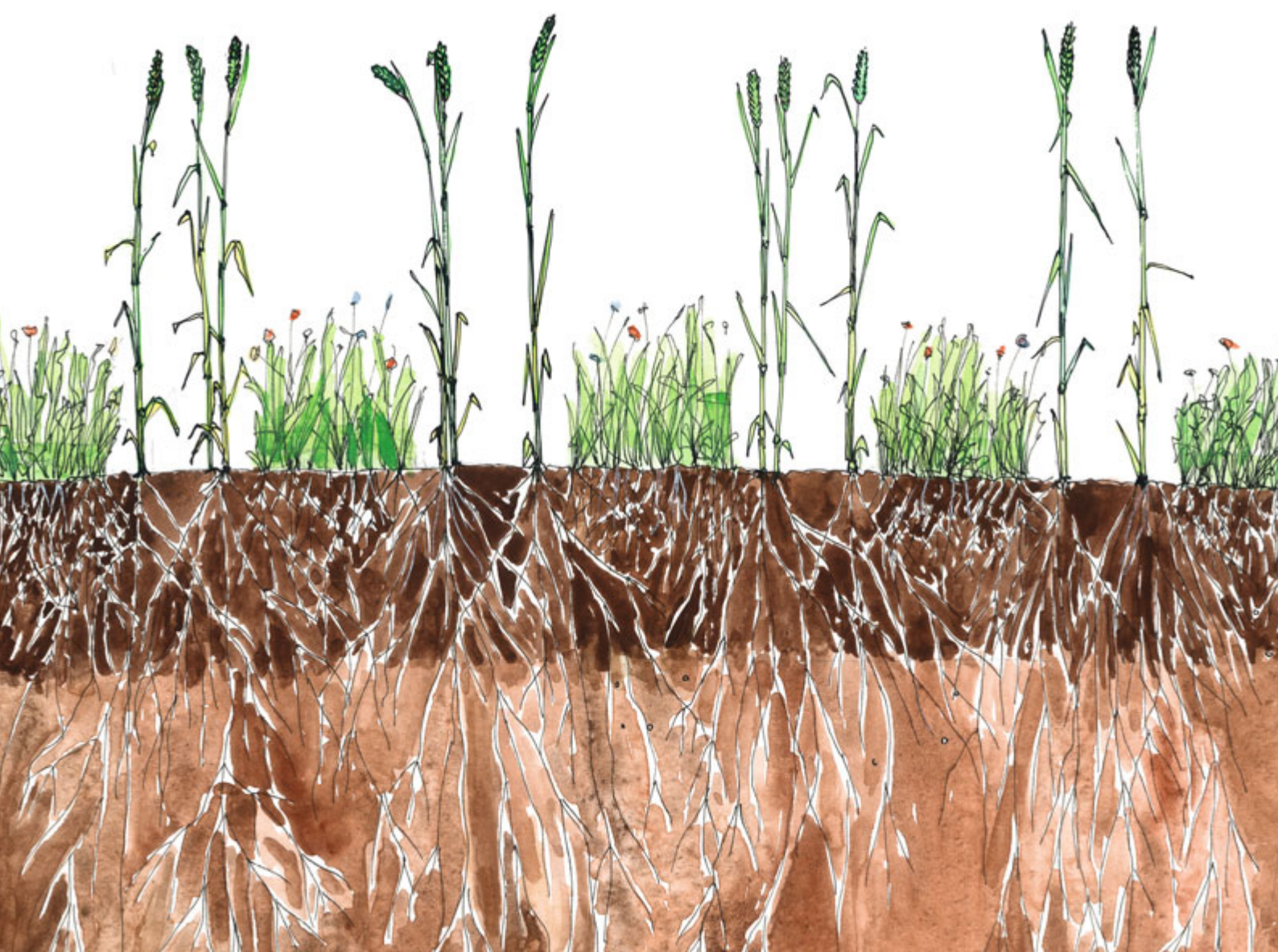


Plant protection agents (€/ha) -43 %

Machine costs (€/ha) +63 %

✔ Total costs are the same – despite high hourly rate of 60 €/hour

✔ Considerable increase in the time requirement – precision costs time



Cereals with companion plants in the CRF system:
Double row with a spacing of 50 cm for adequate plant density

Copyright: Lothar Rahenkamp 2019



**Innovations
in Groundcare/
winter road gritting**



IceTiger

More precision in winter road gritting



The IceTiger features the unique Smart Precision system with an hydraulically driven floor belt, state-of-the-art ISOBUS control and precision spreading disc

Video of IceTiger in use:
www.amazone.net/yt-icetiger





With working widths from 2 to 8 m, the IceTiger can therefore be perfectly tailored to the demands of the area needing treatment

AMAZONE now offers the IceTiger, an innovative new mounted spreader for the application of salt and brine with the highest precision and which represents a completely new development. The new conveying technology via a belt floor belt makes the application of salts with different moisture contents possible, even in very small quantities, as well as the application of slip-preventing materials such as grit or sand. The IceTiger, when used in combination with the comfortable ISOBUS control, becomes a precision machine for winter grit spreading.

Innovation: Smart Precision System – Adjustable belt floor and electric delivery point adjustment via ISOBUS

The hydraulically-driven feed of the material to be spread via the floor belt is a unique feature. Thanks to the wide contact surface, the material to be spread is continuously transported without clogging and bridging towards a chute which feeds it down onto the spreading disc. A hydraulic motor allows the speed of the belt floor to be precisely adjusted to run fast or slow, so that even extremely small quantities - down to 5 g/m² - can be applied as and when required. Working widths from 2 to 8 m are possible via the precision spreading disc. The IceTiger can therefore be perfectly tailored to the demands of the area needing to be treated.

The Smart Precision System also offers a significant advantage in the way that the delivery point is adjusted electrically via ISOBUS. In this respect, the required degree of spread to the left or right is comfortably and easily set from

the tractor seat. The spread fan is shifted by an electric actuator whilst the vehicle is travelling on the road. The electric delivery point adjustment then accurately sets the delivery point of the material to be spread automatically, in order to produce the desired symmetrical or asymmetrical spread pattern. This electric delivery point adjustment works in conjunction with the automatic regulation of the spreading disc speed. This flexible adjustment of the working width allows the spread pattern to be precisely set for either spreading on just one lane or two lanes at the same time. Furthermore, the triangular spread pattern can be narrowed in such a way that the complete road surface is optimally covered, for instance on roundabouts.

Optional: integrated pre-wetted salt system

The IceTiger can be equipped with a brine applicator with a total tank capacity of 500 l for the application of FS30 pre-wetted salt as an option. Solid salt and brine are mixed together immediately upstream of the spreading disc, whereby the precisely adjustable supply of brine is provided via a hydraulically-driven pump with run-dry protection. The mixing of the two products results in a reduction of the salt content by approx. 23% compared to dry salt. Apart from faster de-icing, wind losses are significantly reduced.

The optional brine device with a total tank capacity of 500 l is integrated into the overall design concept, meaning that the IceTiger remains close to the tractor with a favourable centre of gravity





AmaTron 4 ISOBUS terminal - for maximum comfort



The EasySet 2 operating terminal – easy to operate

AMAZONE offers the in-house developed AmaTron 4 terminal for ISOBUS control, meaning that even tractors which are not ISOBUS-compatible as standard can be retrofitted with the AmaTron 4 for winter road gritting. The tablet-style terminal features an 8" multi-touch colour display with day-night mode, a practical quick-start menu with intelligent menu navigation as well as automatic fade-in of the touch buttons via proximity sensors. All functions in the work menu can be actuated via the AmaPilot⁺ multi-function joystick or other ISOBUS multi-function joysticks for maximum comfort.

Smart operation with EasySet 2 – cost-effective and environmentally-friendly

The basic version of the IceTiger is controlled via the machine-specific EasySet 2 in-cab terminal. The simple, intuitive operation only requires brief orientation, making it ideal for use with multiple drivers. After the required spread rate and the desired working width have been entered,

the application rate is regulated automatically depending on the forward speed. The delivery point is adjusted manually when using EasySet 2. The +100% function can be used to double the spread rate on critical areas, such as on bridges or at road junctions. The calibration of working width, speed and application rate is also possible at the touch of a button. In addition, the LED work lights and the rotating beacon can be actuated via EasySet 2. A reversing camera with a view of the spread pattern as well as an internal hopper camera for monitoring the fill level are optional.

Larger hopper for higher work rates

The basic version of the IceTiger winter salt spreader is equipped with a 1,000 litre hopper. The hopper has a favourable centre of gravity created by the 3-point linkage positioning and the steep hopper walls. Any material residues are thus reliably avoided. The capacity can be expanded up to a maximum of 1,900 l by means of 300 l or 600 l extensions as an option.





AMAZONEN-WERKE · The ideas' factory
D-49205 Hasbergen-Gaste/Germany
Phone: +49 (0)5405 501-0 · Fax: 501-193
www.amazone.net

AMAZONE LTD
Orchard Farm, Hurst Lane, Auckley,
Doncaster, South Yorks., DN9 3NW
Phone: +44 (0)1302 751200
www.amazone.co.uk · E-Mail: sales@amazone.co.uk



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