

A logical combination

Precea 3000 ACC Super is a precision drill that was developed for mounting on the company's 3m rotary cultivators thereby extending Amazone's range of mounted mechanical and pneumatic drills. We tried the combination in the field drilling a crop of maize.

Amazone's new Quick-Link system presents a major advance in making it much easier to mount a drill on a power harrow or rotary cultivator. This beckons the question of whether cultivators couldn't also take a precision drill then - after all, this is a very popular combination. Following this logic, Amazone developed a cultivator-mounted version of the new Precea precision drill as a tailor-made version for their KG and KX cultivators. With the machine sitting on the cultivator, the fertiliser hopper moves very close to the tractor, which in turn allows the hopper to grow considerably in volume. In addition to that, the new drill has all it takes for precision drilling and fertiliser application. We have

the long and the short of the combination.

MADE FOR COMBI DRILLING

Our test combination was a KG 3001 Special with a 600mm tooth packer roller and bout markers. In this specification, the machine requires one sa and one da spool - one supplying the optional bout markers (€2,035) and the other the optional hydraulic depth control system (€1,660) with oil.

Coupling the KG and Precea really worked a peach in the test. The Quick-Link System makes the job clearly easier than it was on the previous rotary cultivator models. When removed from the cultivator, the drill rests on optional stands (€315). To mount the drill on

the cultivator, the tractor reverses the KG under the drill until the hitch points align with the transverse tube. Then the linkage is raised, which secures the two Quick-Link couplers in their latches. Next, the mechanical top link is coupled to the KG. Last, you connect the hydraulic and electronic lines. Done. The Precea ACC is a combination machine that is not suitable for solo operation. Its blower and the optional fertiliser auger require two da spools and a pressureless return line. The communication between the terminal and machine takes place via the Isobus.

The single most prominent feature of this drill is its sturdy design to which the big fertiliser and seeding discs add their own weight. Furthermore, two

Die new Precea 3000 ACC Super can do both - preparing the seedbed and drilling into it.

Photo: Huesmann



more tonnes are accounted for by the toothed packer and then of course another 1,200kg by the Precea itself. After the nominal amount of nearly 1,000kg of fertiliser and about 200kg of seeds is filled into the tanks, the combination is tipping the scales at a whopping 4.4 tonnes. This means it not only takes a heavy counterweight up front on the part of the tractor before the combo is allowed to travel on public roads but also a 'real' tractor that can handle the package – preferably one in the 150hp+ range. Although a smaller tractor may be able to handle the combination, the fertiliser hopper would have to be left half empty.

WHOPPING VOLUMES

The 950-litre fertiliser hopper is made from steel and has a roll-up PVC tarp cover that is secured with two rubber bands. This means, operators have to walk around the machine to undo / fix these bands, because the rear catwalk doesn't span across the full hopper width. Awkward. Filling the hopper is easy with the optional 150mm diameter auger (€3,711). From the auger the granules drop from a height of about 1.10m into the hopper - provided the extra chute is fitted. If it isn't, the height is 95cm. Its hydraulic drives require a moderate oil flow of 20l/min. The maximum rate is 32 litres. In addition, the auger can also be enabled/disabled from a cross-valve. The flow of granules is controlled by an adjustable deflector plate at the Y-shaped outlet. The auger box is cleaned after removing a cover by undoing two screws. Those who don't include the auger in the order can fill the hopper from the rear or side with big bags, for example. The overloading width at the rear is 2.10m and the hopper height is 2.20m. Filling the hopper from the rear with the loader will be difficult on machines that have the extended air intake pipe (€365).

Inside the hopper we found lights which are standard specification. Excellent. Also, two inspection windows in the front wall give a clear view of the fertiliser level inside the tank and there is a low level sensor that triggers an alarm when the level drops to 80kg.

EASY CALIBRATION

Inside the tank, the granules are fed to the metering units by an agitator shaft which is protected from foreign objects by two screens. Fertiliser metering is

electric as standard specification on the mounted Precea. The four Precis meters are interconnected by a box section shaft but will have separate drives from the next season. Cell wheels meter the granules into the delivery tube that departs from each wheel. They are shot pneumatically down to the coulters which are double discs that mount on leaf springs and are clipped to the tube section beams - just like the seeder units. They place the granules at a default depth of 5cm and in a band next to the seed row. The depth is altered only with a tool, which is a pity; accessibility isn't particularly good either. Things should be easier here.

This said, plus points go to fertiliser calibration testing. The operator enters the hectare rate to the terminal and then starts the testing. The granules flow from the metering units onto the calibration tray after the doors are pulled open on a thick knob. Next, press and hold the calibration button on the left machine side until the metering units come to a stop. This can be done automatically on machines that are controlled by the optional TwinTerminal. The scales and a bucket are stored right above the calibration panel. Excellent. After calibration testing is completed, the amount calibrated and collected in the trays is weighed and the results are entered to the terminal which reads out the difference from the optimum rate as a percentage figure. We usually had to run two testings before the result was accurate. The accuracy of fertiliser distribution across rows was really good in our test and the calibrated rate was metered accurately into the ground.

SEEDS AND GRANULES SHOOT PNEUMATICALLY INTO THE SOIL

The fan which supplies the fertiliser metering and the seed singling systems is driven hydraulically on any model. Maize seeds are delivered at 45mbar. This requires an oil flow of 28l/min which drives the blower at approx. 4,000rpm.

The seed hoppers hold 55 litres each, which is the equivalent of two packs of most seed varieties. The filling height is 1.20m which is quite high. The lids on the robust plastic tanks have sealing rings for tight fit. You can check the flow of seeds by operating the drives by pressing a button on each of the seeder units. There is also a window on the single seed metering that shows the



Photo: Tastowe

△ Amazone presents a straightforward solution for coupling Precea to a rotary cultivator.

seeds clinging to the disc - a detail we really appreciated. The seeder can also be specced with low level alarm sensors as an option. Our test machine had only one sensor, but this was fine as we didn't fill that tank to full level.

The pneumatic singling unit is a new feature on Precea. This presses the seeds into the holes in the singling disc which rotates in travelling direction. Any doubles are stripped from the holes by a three-fold roller. This stripper can be adjusted electrically on the cultivator-mounted Precea, which is done from the cab. Better still is the Smart Control feature which controls the strippers automatically. We really appreciated their work, because they gave an outstanding singling effect. When a seed is over the outlet, the stream of air is cut by a small rubber

SUMMARY

Amazone launches the new Precea 3000 ACC Super as a mounted drill that combines seedbed preparation with drilling.

The drill scored on straightforward setup options in the test. Coupling to the rotary cultivator, too, was great.

The seed metering system uses air to single the seeds – a detail that makes it possible to work at higher forward speeds.

Fertiliser and seed rates are controlled separately by using two separate application maps.

wheel and the seed drops into the delivery line. Cracked seeds or any debris or dressing left in the holes are removed by a star wheel. The drop height is 45cm with seeds passing an optical sensor which monitors the performance of the singling system. The machine is supplied with a choice of three different holed discs (green, pink, white), each has 42 holes of different diameters. We always used the green disc in our test. Its 5mm diameter holes allowed us to achieve good singling results in 15 different varieties.

We also assessed the drill for both ride performance and seed placement for which we used our own equipment. Precea is reckoned to achieve great placement accuracy while working at rates of up to 15km/h. In ploughed land we drilled Stromboli at a seed rate of 8.6 plants/m² which we entered to the terminal. We measured very few doubles and gaps. At ground speeds between 6km/h and 14km/h the target spacings were maintained in 95% of all cases. This averaged result is good. Yet, we couldn't find the reason for the rather high standard deviation of 60mm in the rows (seeds scattered around the average actual spacing achieved). We reckoned this could have been attributed to the rotary cultivator and the extremely sandy soil which didn't offer any resistance to the seeds so they would roll before they were caught by the catch wheel. So we will repeat these measurements in the next spring. By the way, the few gaps we discovered were attributed to poor germination in many cases.

EASY SETUP

A small slider controls the opening at the bottom of the seed tank from where the seeds flow to the singling unit. You can close the opening all the way for swapping discs. On the left side of the seeder there is also a quick emptying mechanism. Its chute is stored inside the cover of one the seeder tanks. This chute can be attached either to the left side of the quick emptying mechanism or to the right under the seed singling unit. So seeds are no longer lost when being emptied. Excellent. We also appreciated that the singling unit is assembled without tools. As a first step, the cover on the side of the seeder unit is easily removed thanks to two bayonet fittings. Then remove the seeder and replace the disc without a tool. There is even an LED light here to make the job



Photo: Huesmann, Tastowe (1)



△ 1) Fertiliser calibration testing is done on the left machine side. 2) The singling discs are swapped without tools. 3) The pressure on the coulters is applied by springs.

easier at night.

Another special detail was discovered in the lid of the metering unit: the high-pressure singling chamber rotates along with the seeding disc. This eliminates any friction on the part of the large seal and reduces the electric input to 0.5amp for each seeder unit. These 0.5amps per seeder are no big deal for the Isobus socket.

Setting up the seed placement and bedding system is also straightforward and without tools. Reasonable and lasered scales help find the required setting. The seeder units are mounted on parallel links. The coulters pressure is set on a tensioning spring which provides seven increments from 120kg all the way up to 200kg, says Amazone.

The slot is cut by the so-called Pretectines. Clod removers are available as an optional extra. The two discs measure 400mm in diameter and have 400mm diameter and 115mm wide rubber wheels for depth control. A furrow opener consolidates the bottom of the slot before a catcher roller presses in the seed. The optional covering discs were not fitted on our machine, but we didn't really miss them in our loamy and very sandy soils. The press wheels in V-arrangement that run behind the catcher roller closed the slot effectively and, depending on the setup, they pro-

duced only a minimal elevation. The press wheels come in various versions including for sticky soils so they are removable.

IN-FIELD PERFORMANCE

We certainly liked the optional hydraulic depth control on the rotary cultivator which was particularly useful on headlands where it avoided creating ridges when cultivating a bit deep. The optional bout markers are mounted on the KG/KX and are mechanically secured in the transport position. Our average work rate was about 10 km/h and at that speed that rotary cultivator still delivered a reasonable quality of work. The ha/h performance in our rather small fields was 1.5ha/h on average.

As we observed more and more farmers combining a deepsoiler with the power harrow and maize drill we wanted to know whether this would also be something that worked for Precea and the rotary cultivator. The deepsoiler we used increased the length of the entire combination by 55cm and added 500kg of weight. In order to raise that rig we coupled it to a Fendt 828. But even though we left the fertiliser hopper empty and gave that tractor a 2t front weight, the load on the rear axle was 12.2t – too much for



△ The fertiliser and seeds were applied using application maps from the Amatron.

road travel. Obviously filling the fertiliser hopper wouldn't make things better. Consequently, this rig would never travel legally on public roads – no matter whether the tractor is up to the job. Following a crop of green rye, the maize emerged very well and developed well showing a uniform growth.

ALL MAPPED OUT

Amazone gave us their Isobus-compatible Amatron 4 for our test, but any other Isobus-compatible tractor terminal is equally suitable, and indeed, controlling the combination from the Fendt and the John Deere terminals was a peach. Drawback was that these branded terminals were not cleared for Amazone's Section Control and so we used this feature from the Amatron. Yet this couldn't pick up the GPS signal directly from the Isobus so we had to install an extra cable on the Fendt which was plugged into the RS 232 interface. After the baud rate (signals per second) was set up, we were ready to go. On the John Deere we had to install another y-cable to pick up the signal. These solutions are however rather outdated in our view. We feel all tractor manufacturers should provide the signal through the Isobus so the Amatron would get the GPS signal from the tractor Isobus. In fact, this is what other tractor manufacturers have been able to implement already.

The 'virtual headland line' feature was very useful and we really appreciated it. This means that the terminal creates an in-field boundary which runs at a certain distance from the headland. When the feature is enabled from the terminal, the machine automatically shuts off the supply of granules and

seeds when tractor approaches the headland - with the supply of maize being cut by individual row and that of granules for all rows (by individual row is a future feature). Then you drill and cultivate the headland. So, no wheelings anywhere. Top notch. Drawback about using the Section Control feature from the Amatron terminal is that you have to enter the tractor measurements manually. An important parameter here that shouldn't be messed with is the distance between the GPS receiver on the tractor and the coupling points on the rotary cultivator. So, make sure you get this measure right. Afterwards in the field, verify whether the individual switchings are made on time - both when entering and leaving the bout. This shows that it does take some time to set the system up. The good news is that you can save the settings to individual tractor profiles.

Precea allows operators to control both the fertiliser and seed rate at variable rates. This is made possible by providing two different application maps. Key point here is that the terminal is able to process two different maps. We got help from the firm Kleffmann who assisted us in creating the two maps. Upload and use of these maps worked a peach on the Amatron.

Our overall impression was really good in the test. We noticed that the designers had put a lot of thought into the setup and the provision of practical solutions. The only grumble goes to the fertiliser coulters that could do with being easier to adjust. With regards to electronics, there are still a number of interfaces to be standardised. Otherwise, the system worked reliably.

Drawback of this comprehensive technology is the price at which Precea is marketed. The price for the road-going version (provided your tractor has an Isobus-compatible terminal) is €57,000. The machine in tested specification is priced at €69,183 of which €24,913 is accounted for by the KG. This is quite an investment that calls for plenty of acres.

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Translated into English by trans-agrar.



VIDEO

Watch our video documenting the tests at www.topagrar.com/precea2021

CULTIVATOR DRILL

Technical data	
Active cultivation	
Machine type	KG3001 Special
Working width	3,00m
Weight	2,000kg
Packer roller diameter	600mm
No. of spools	2 da
List price for road-worthy specification ¹⁾	€21,218
List price in test specification ¹⁾	€24,913
Precision drill	
Machine type	Precea ACC-3000 Super, 4-row
Row spacing	75 cm
Seed hopper capacity ¹⁾	55 litres
Filling height	120cm
Cell wheel diameter (mm)	260mm
Number of cells for maize	42
Cell diameter	4.5; 5; 5.5mm
Seed drop height	450mm
Depth wheel diameter, width	400mm, 115mm
Seed coulter diameter	400mm
Catcher roller diameter, width ¹⁾	300mm, 16mm
Press wheel diameter, width	375mm, 50 mm
Seeder pressure	102 – 200kg
Fertiliser hopper volume ¹⁾	950 litres
Fertiliser coulter diameters	390mm
Fertiliser - seed coulter spacing	580mm
Spool valves	2 da + return
Drill kerb weight	1,200kg
List price for road-worthy specification ¹⁾	€35,729
List price in test specification ¹⁾	€44,270
Specifications of the combination	
Dimensions (H x W x L)	300 x 300 x 350cm
Dimensions (H x W x L) without auger	260 x 300 x 310cm
Total kerb weight	3,200kg

¹⁾ Manufacturer information, all pricing excl. VAT.

Source: top agrar, top agrar measurements