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Krone Big X 630 self-propelled forager:

The little Big

In 2013 Krone introduced the narrow-body Big X 480 and 580, expanding the range with the 530 and 630 in 2015, and last year all four models benefitted from a thorough facelift. We've been trying out the 630 flagship

It's not just the 630mm intake and drum that separate the Big X 630 and the other narrow-body choppers from Krone's big and wider range. There are also some key differences in the engine department.

While the higher-horsepower units currently use Liebherr motors, the Big X 630 is powered by a transversely mounted MTU in-line six-pot. The engine has a single-stage turbo and produces 480kW/653hp from the 15.6-litre block, which Krone says delivers a continuous chopping power of 452kW/615hp.

And the machine can sit at 3.0m, making it a real contender for ag contractors navigating narrower roads.

OptiMaize spec

All the options available on bigger capacity foragers are also offered on the Big X 630. Our test machine had the full accompaniment of options including OpitMaize for maize work. The list of options and headers included the following:

- MaxFlow drum with 36 blades and shearbar (£6,550)
- OptiMaxx corn processor with 250mm rollers and 30% speed differential (£13,620)

With its narrower drum, the Big X 630 shows what it's capable of ... and not just in grass.

- Mechanical VariLOC gearbox to vary chop length from 3mm to 24mm (£10,170)
- Four-wheel drive (£17,170)
- CropControl yield metering system and NIR sensor (£9,900)
- Easy Load automatic trailer filling system (£8,470)
- LED lighting package (£4,740)
- 10-row XCollect 750-3 maize header with Comfort Guard (£146,850)
- EasyFlow 300S grass pick-up (£22,410).

With the 10-row XCollect, the 630 achieved a fresh mass throughput of over 200t/hr in maize.

The side panels can be opened nice and wide, while the back mudguards can be removed without any tools.

THE SHORT VERSION

- The Big X 630 impressed us with its output and chopping quality.
- A transport width of 3.0m and a turning circle of just over 12m make the 653hp forager very manoeuvrable.
- When converting from grass to maize, Krone sets new standard in some aspects.

TEST ASSESSMENT

Krone Big X 630

XCollect 750-3 maize header	
Attachment/removal	○
Crop flow/losses	+
Risk of blockage[1]	+/−
Ground contour control	+
Speed changes	++
Row sensor	+
Field/road changeovers	++
Build quality	+
EasyFlow 300S pick-up	
Attachment/removal	+
Quality of crop gathering	+
Ground contour control	++
Reversing	○
Crop flow/risk of blockage	+/○
Field/road changeovers	++
Pick-up/machine cleanliness	○/+
Build quality	+
Krone Big X 630 forage harvester	
Engine characteristics	++
Fuel consumption	○
Ground drive	+
Throughput	+
Chopping quality	++
Metal/stone detector	+
Length-of-cut gearbox/VariLock	++
Chute blower	++
Chute	+
Manoeuvrability	++
Weight	○
Road transport	++
Cab, noise level	+
Controls	+
All-round visibility[2]	++/−
Accessibility	+
Build quality	++
Maintenance	++

[1] in/against storage direction; [2] − when overloading at night because of reflections in the rear window
Grading: ++ = very good; + = good; ○ = average; − = below average; −− = poor; / = not available

Eco- and X-Power

The MTU 6R1500 motor in the Big X 630 showed its robust side with remarkable power in both grass and maize. We could reduce the speed of the six-cylinder motor all the way down to 1,300rpm in extreme cases. One neat detail, if the worst comes to the worst, is that you can set a minimum engine speed at which the header and feed rollers will stop. The most efficient point for the chopper is around 1,700rpm.

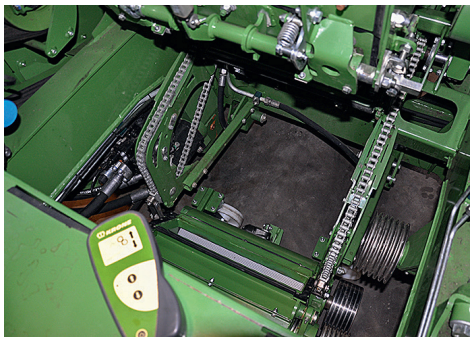
To meet Stage V, the exhaust system uses SCR, DOC and DPF. While the AdBlue tank holds 115 litres, you can carry a total of 1,450 litres of diesel with the extra 230-litre fuel tank as specified on our machine. Unfortunately our automatic nozzle would trip once the diesel tank reached 90%, so you had to do the last bit by hand if you wanted to brim the tank.

The engine management allows the Big X 630 to adapt to the conditions. There are two modes, Eco-Power (400-520hp) and X-Power (615hp). In Eco, you can alter the power in 30hp increments from Eco-- to Eco++, or you can opt for auto power, splitting where the power curve is continually adjusted according to the current demands. You can switch from Eco-Power to X-Power when you are working, but not the other way in case you cause a big bung-up. The auto engine speed reduction when the header is raised or the harvester is at a standstill is a nice touch.

Steady in grass...

In average grass crops we were able to save 27% in diesel at 460hp in Eco mode – with a 24% lower output. With over 20t/ha of grass we were more efficient in Eco++ (520hp), which still produced a handy 18% fuel saving compared to X-Power. First cut was delayed in the area due to the weather (ie crops were heavier than normal) so we went with half the number of knives and chopped at 12mm. Despite the bulky crops, average output was 164t/hr of fresh matter without accounting for headland turns and just under 70t/hr dry matter at 42% DM. If we went with a longer chop length the 630 could have cut more, but the test-site farmers prefer a short chop for grass. Krone also recommends using the full set of knives in grass.

A service trolley is available for both the intake unit and the drum to make changes easier.



'VariQuick' allows quick changeovers between maize and grass or wholecrop. The corn cracker is lowered on a chain and pulled out to the side on rollers.

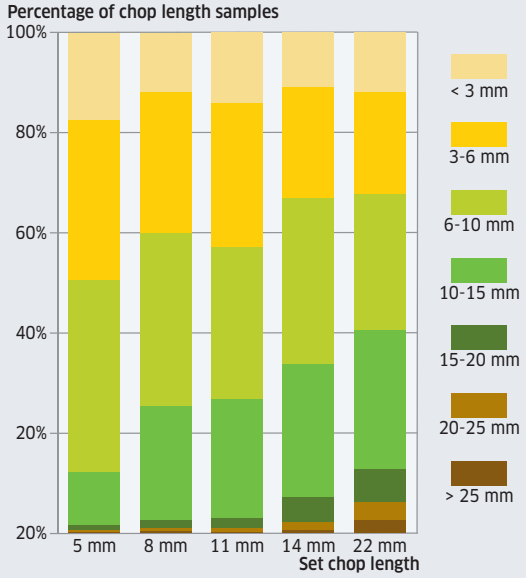
...and also in maize

For maize we went with the 10-row header and all 36 knives. At 5-14mm chop and the cracker set to a 2mm gap, the Big X proved itself yet again. Thanks to the VariLOC, we also chopped at 22mm with a reduced drum speed. Our maize field yielded 60t/ha of fresh mass at 32-34% DM – see 'Throughput and fuel consumption' for more details.

At 5mm, the 630 managed to blow a whopping 191t/hr into the trailers (that's net throughput excluding headland and waiting times). Then increasing the chop length to 8mm pushed the Big X over the 200t barrier. Two more

KRONE BIG X 630 IN MAIZE: CHOP STRUCTURE, THROUGHPUT AND DIESEL CONSUMPTION

CHOP STRUCTURE

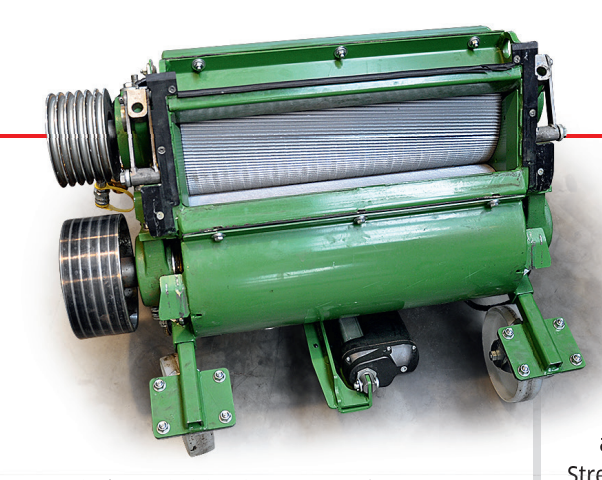


THROUGHPUT AND FUEL CONSUMPTION

Chop length	Fresh mass		Dry matter[1)]	Dry matter	
	Throughput	Fuel consumption		Throughput	Fuel consumption
5mm	191.0t/hr	0.58l/t	31.5%	60.2t/hr	1.84l/t
8mm	200.7t/hr	0.55l/t	32.5%	65.2t/hr	1.69l/t
11mm	204.9t/hr	0.54l/t	33.0%	67.6t/hr	1.64l/t
14mm	210.7t/hr	0.52l/t	33.5%	70.6t/hr	1.55l/t
22mm	212.4t/hr	0.52l/t	34.5%	73.3t/hr	1.50l/t

Silage maize (variety KWS Fabiano) at 31.5% to 34.5% dry matter yielding 60.2t/ha fresh matter or 20.0t/ha to 20.8t/ha dry matter, 2mm cracker gap. All figures are nett and exclude turns, stops etc. 1). Dry matter measurements were taken using the machine's NIR sensor.

As the cut length increased from 5mm to 22mm, the fresh mass throughput increased by 11.2% and the dry mass throughput by 21.8%. At the same time, fuel consumption fell by 10.3% and 15.5% respectively. The chop structure was determined by the Institute for Agricultural Engineering at the University of Bonn using a sieve tower. All fractions clearly react proportionally to the cut length setting. Graph: Tovornik.



The 'BusaClad' hard-wearing surface coating is intended to extend the service life. It costs a significant £15,365 so takes some justifying.

3mm increments increased the output about 5t/hr. At 22mm we were chopping 212t/hr. If the throughput is related to the claimed permanent output of 615hp, the Big X 630 produces 0.10-0.12t of dry matter per hour and horsepower. These are good stats, which can be expected from a model in this bracket. While fuel consumption doesn't break any new records at 0.52l/t fresh matter and 1.50-1.84l/t DM, it's still an acceptable result.

Impeccable chop quality

We were able to give the chopping quality consistently good test marks (see the 'Chop structure' graph) with only an extremely small amount of overlength forage. It was only when we increased the chop length to 22mm that this went up to just over 2% as you would expect. Otherwise adjusting the chop length on the Big X only affects the short cuts of less than 6mm.

We can also attest to the excellent work done by the cracker, which is now 25% wider. All of the corn was neatly processed in the 2mm gap – and that's even when the chop length was increased to 22mm. The 250mm diameter OptiMaxx rollers have their teeth slanted 5° – in addition to the friction effect, this also results in more shearing. We had the 105/123 tooth cracker with a 30% speed differential. There is the option of other pulleys to change this speed difference to 40% or even 50% for more intensive conditioning.

Quick crop changes

Swapping between the processor and grass channel is simply brilliant. Using a chain drive with a crank (option of electric motor), the cracker swings into a parking position or all the way down where it can be rolled out to the side from underneath the forager. Another bonus of this open design is that blockages in grass can be removed more easily, material dropping to the ground instead of operators having to clear the blocked material from the cooling compartment.

Overall, the flow of the Big X 630 ticks all of the boxes; even high-sugar grass is not an issue. VariStream means sprung doors under the drum and the blower so the flow channel temporarily expands, a plus for trouble-free work.

Load-over made easy

The chute offers good control; you can alter the rotation and flap speeds. Krone's StreamControl offers three different throws. The blower is so powerful that you don't even have to move the chute to its highest position, and even at full throw the crop flow is still nice and tight. The end of turn cushioning for the chute is nice, though we would have liked a larger swivel angle. The optional auto filling system also operates accurately and can now be used with a following trailer. Filling levels and strategies are adjustable, taking some of the pressure off the chopper driver.

The EasyFlow 300S pick-up showed no real design weaknesses when on test ... except for the friction clutch for the auger. Right: The header and harvester can move apart slightly with the hoses still connected when giving the area a thorough blow-down with a compressor.

Good joystick, great terminal. We could only find very minor things to criticise in the cab.

Slim 22 tonnes

Chopping maize with the 10-row X-Collect 750-3 header, the tested Big X 630 weighed in at just under 22t. The header accounts for 4.1t of this, while the removable rear weight is 1.4t. Looking at the split between the axles, there is 14.1t on the front wheels and 7.7t on the back.

This makes the header transport support wheel essential (or at least in Germany) if you don't want to flaunt axle weight limits. The wheels are integrated into the maize head, as is the transport protection. On the road, the header lowers automatically and the shock absorption system activates. This makes the Big X extremely pleasant to drive and, thanks to its narrow body design, it measures exactly 3.0m when booted on the 42in 710 tyres.

For narrow headlands

Independent suspension on the back axle of the machine provides additional comfort and welcome manoeuvrability. A narrow outer turning circle of just over 12m is no doubt a sector benchmarker, making it possible to loop around and back into work when cutting maize. The big 710 tyres provide plenty of ground clearance and also proved their worth in wet conditions.

The smooth hydrostatic drive allows the wheel motors to speed up to 25km/hr in field mode. There is no need to shift gears: in road mode, the forager will work its way up to what feels like a rapid 40km/hr. The rate of acceleration for each nudge of the stick is programmable at the side.

For chopping we would select rate one or two but this leaves reversing on the slow side. Krone says it is working on a solution for this. It's great to be able to freeze the speed on the joystick or change the cruise control.

Good ground hugging

In grass, we used the 3.0m wide EasyFlow 300S camless pick-up. The gauge wheels plus central support roller work with the pendulum frame to ensure good ground following and

crop gathering performance. The pick-up tines are staggered to help create a consistent flow to the six feed rollers, and their speed can be infinitely adjusted.

In high-yielding crops when working with a short chop length, the friction clutch for the feed auger limits the throughput. A stronger (cam-operated) clutch would, in our view, be a better choice. RockProtect stone protection works effectively. We also liked the reversing mechanism on the intake assembly and the pick-up, which is even possible when the drum is not spinning.

With the pick-up, the forager stays perfectly clean – but at the expense of the driver view into the header when the perforated plate is clogged with trash. Cleaning the pick-up and feeder housing in the field is a simple enough job. The hydraulic header lock and the long hoses mean you can detach the header and then move back 50cm to give everything a blast with an airline. There are plenty of air connections on the 630 to make the most of the compressed air supply.

Separate cut

The 10-row maize header splits the process of cutting and feeding the crop. Fast spinning sickle discs cut the plants, the stubbles left suitably frayed to help them to break down quicker. Above the discs are the familiar endless collectors that transport the plant longitudinally into the machine.

Harvesting maize, some of which would reach the cab, our experience with the additional feeder instead of the normal tube hoop was good. This makes the plants move in like tin soldiers. The last few headland stalks are also reliably fed into the machine. The XCollect picks up the remaining rows a little more centrally than out to the side.

Comfort Guard may cost £8,430, but it does offer important additional safety. And it also speeds up travelling between harvesting sites.

In laid maize, the XCollect works perfectly in the direction of the laid stands. If the maize plants are lying towards the forager, the short header pulls the plant before it is cut. We liked the active ground contouring. You do need to be careful when reversing so that the feelers don't break off, but you can set it up so the header auto lifts when you select reverse.

The new automatic Comfort Guard is top notch, and it would want to be for £8,430. When folding, the lights and the protective curtains swing into place automatically and securely close it in. This extra guarding doesn't hamper the header in the field.

Just like the pick-up, you can simply park the folded header on the transport wheels. We were just missing a convenient quick coupler for the hydraulic hoses.

Easy service and maintenance

We awarded good marks for maintenance and being able to swap between crops. Most of the bearings are looked after by the auto-lube system, with any others being easy to reach. Blowing down the 630 including the radiator works well – there are no significant nests in which chaff can collect.

During our field test, a power belt was torn in grass and a bearing worked loose from the intermediate gearbox in maize. Krone reckons this was down to a fault in the material of both failed parts.

The German company can supply an optional service trolley for both the intake assembly and the drum – ideal for removing/handling the substantial unit on level ground. When assembled, the intake can be opened at the top to inspect the blades. The knives are bolted to the drum and aligned relative to the shearbar with an eccentric spanner that also works well. The end pieces on the chute can be quickly replaced. There are connectors for oil, electrics and the camera to make removal/attachment a doddle.

In our testers' opinion, the active feed system is better in tall maize than the hoop.

Comfortable, but not perfect

The accommodation offers good visibility and comfort, only leaving a few minor criticisms. For example, the door should close better, and the sealing rubber above the door needs a redesign so a handful of chaff does not fall into the cab every time it's opened when the machine is chopping grass.

MEASUREMENTS AND PRICES

Krone Big X 630

Max engine power[1]	**480kW/653hp**
Diesel/AdBlue tank[1]	**1,450/115l**
Diam./width chopping drum[1]	**66/63cm**
No. of chopper blades	**36 (2 x 18)**
Chopping frequency[1]	**21,600rpm**
Spout rotation angle/time[2]	**210°/19s**
Maximum unloading height	**6.76/7.38m**
...at this overload width[3]	**1.42m**
Field/transport speed	**25/40km/hr**
Turning circle left/right	**12.44m/12.24m**
Noise level at driver's ear[4]	**73dB(A)**
Kerb weight[5]	**17,730kg**
Front tyres	**710/70 R42**
Rear tyres	**620/70 R30**
List price, base specification	**£370,495**
List price, test spec	**£487,690**
EasyFlow 300S pick-up	
Work/transport width	**2.80/3.00m**
Weight	**1,360kg**
List price	**£22,410**
XCollect 750-3 maize header	
Number of rows/work width	**10/7.50m**
Weight	**4,120kg**
List price, base specification	**£146,850**
List price, test spec	**£168,895**
Big X 630 with XCollect 750-3	
Transport L/W/H	**8.90m/3.00m/3.86m**
Ground clearance	**0.46m**
Weight in work	**21,860kg**
Load distribution front/rear	**14,100/7,740kg**
Big X with maize header + pick-up	
List price, test spec	£675,995

Prices excl. VAT; [1] Manufacturer information; [2] incl. end of turn cushioning, fast mode; [3] Distance between the vertical flap and the header; [4] At 1,700rpm in maize (68 to 76dB(A)); [5] without header, with 1,400kg rear weight

We would certainly add the LED pack, which includes 17 work lights and useful maintenance illumination – even if they are reflected in the back window when unloading.

When harvesting maize at night we were put off by the reflection of the otherwise very good rear LED work lights in the back window. The noise level is OK: the deep hum of the engine is more distinct than the crop flowing through. You quickly come to terms with the armrest and the joystick. As for neat details, two memory buttons on the joystick can be assigned, as can the optional foot switches on the left and right of the steering column. Perhaps the shape of the buttons on the joystick could be changed so that you can feel a difference with your thumb.

The 12-inch terminal is excellent stuff. The screen is glare-free, and the camera image is very clearly displayed. Everything, from the engine through to the crop flow system plus the various hydraulic functions, is neatly adjusted and individually positioned from here. This is one area where the Krone really shines.

Other details

- The Big X's blade sharpener and automatic shearbar system are effective.
- The steering system worked well in maize. There is now a swath detection system for grass.
- Krone doesn't offer a tyre pressure control system. A 76cm track is available for the 480 to 630 so it does not exceed 3.0m on the road.
- We used the 275-litre additive applicator. For super low rates there is a new option with a 19-litre insulated tank.
- The NIR sensor measures crop dry matter. Jointly developed with Zunhammer, it will also measure the nutrient value of forage and slurry.
- SmartConnect telematics is standard.
- The forager automatically records all data for field specific documentation.

Summary: The solid Big X 630 may belong in the compact, narrow-body class, but it has some great features such as its ability to offer a wide range of chop lengths and very good chop quality. The Krone forager also scores with its manoeuvrability and road-friendly 3.0m width.

There are only a few design details that could improve the working place, and the maker has already solved the problem of switching between grass and maize in a practical and convenient way.

Anything but 'A little Big' is the list price. At over £370,495, there should be plenty of scope and haggle room to make this 600hp a genuine proposition.

Jan-Martin Küpper

profi international, Kelsey Publishing, The Granary, Downs Court, Yalding Hill, Yalding, Maidstone, Kent ME18 6AL, UK Email: Mark.Brazier@kelsey.co.uk Tel: 07813 671484