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LANDWIRTSCHAFT AUF DEN PUNKT GEBRACHT

ONE FOR ALL



With compliments from

 **KRONE**
THE POWER OF GREEN

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ONE FOR ALL

The **ZX from Krone** is more than a forage wagon that gathers grass with the pick-up. Courtesy of its solid steel body, the ZX is also a silage trailer. We put the ZX 430 GD with 48-blade cutting system through its paces in grass.



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The high-capacity ZX self-loading forage wagon and silage trailer has a 48-blade cutting system and an all-steel body.

Farmers are also hauliers by necessity rather than choice. With trailers being in short supply in the heat of harvest, a dual-purpose wagon like the ZX offers clear advantages. Not only is the ZX a forage wagon that picks up grass, but – thanks to its solid steel body – also serves as silage trailer.

As appealing as this dual purpose is, it was not the main buying argument for German farmer Peter Goldbrunner. The main reason why he invested in the ZX was the self-loading feature and in particular the light-pulling design, because his Case IH Puma CVX 170 maxes out at 205hp and Krone claims a minimum input power of 210hp for the ZX 430 GD. The machine's potential can be gauged from its massive drives that are able to handle 400hp.

“If our tractor had more grunt, I could occasionally go faster,” says Peter who is a livestock farmer and contractor. “But the swaths aren't usually as big around here to put the wagon at risk of choking.” Krone says that the machine can work at a rate of 15km/h and more - provided the tractor is suitably powered. Our Puma was rated at 170hp and allowed us to work at 10-11km/h.

Peter Goldbrunner opted for the ZX 430 GD model which runs on force-steered tandem axles and has a capacity of 43m³ (DIN). The body complete with the floor is made from steel and conical at the rear for smoother unloading. The material is unloaded in a uniform mat by three discharge rollers – a detail that makes clamping easier for the wheel loader or compacting tractor since less material needs spreading.

But let's start at the front end: The drawbar attaches to the bottom-mount 80 ball and the rod that steers the tandem axle connects to the tractor via a 50 ball. Unlike the drawbar on the previous ZX, this articulated unit has two hydraulic cylinders now. Its standard-fit suspension makes for quiet running both on public roads and in the field. The tongue load is up to 4 tonnes depending on the tractor.

43M³ CAPACITY

The sides are smooth on the inside and the beams are box sections to prevent material builds up here. The mudguards are sloping for the same reason. The left side has a large door that gives easy access into the load area. A speciality is the pivoting headboard which is controlled hydraulically.

IN A NUTSHELL

- The ZX is both, a self-loading forage wagon and a forager-filled silage trailer.
- Running on two or three axles, the ZX models offer capacities of 43m³, 47m³ and 56m³ and the option of rear discharge rollers.
- The cutting system has 48 blades and provides a nominal chop length of 37 mm.

When the machine is loading material, the board is slightly inclined to the rear in a position selected by the operator. When the machine is nearly filled to capacity, the filling level is detected by a sensor which triggers the board to pivot towards the tractor, thereby increasing the load area by 4.5m³. On the clamp, when the machine starts unloading, the headboard pivots to the rear and then back and forth two times, making sure no material is left sticking to it. This mechanism is normally controlled by the PowerLoad feature, the automatic loading system, but the operator is free to interfere at any time via the Isobus control system.

The grass is gathered by the 2,125mm pick-up which – typically Krone – has camless tines that are arranged in a W-pattern, making sure a certain number of tines is in the swath at any one time, which reduces peak torques and ensures the material is fed in a uniform flow and at full width to the rotor. The pick-up tines are 6.5mm in diameter.

The pick-up runs on two large pneumatic wheels that provide proper contouring.

Its height is controlled without tools on a pin-and-hole system right on the unit which also pivots 100mm to the side for transverse contouring. For even better contouring, it was treated with an electrohydraulic suspension that adjusts the ground pressure steplessly to suit individual conditions.

HYDRAULIC DRIVE

The pick-up drive is also controlled from the terminal, courtesy of the hydromotor which allows operators to set the speed steplessly from 80rpm to 150rpm. Provided it is set up correctly, the pick-up operates at a slightly higher rpm that ensures the grass is picked up thoroughly. This can be done automatically, which is also easier, so the rpm adapts automatically to the current forward speed. We appreciated the clean rake.

A practical detail is the hydraulic drive which shuts off the pick-up automatically after this is raised out of work. A new suspension system ensures that the gap between the pick-up and the rotor is maintained no matter the current lift-out height. This improves the crop flow and increases the ground clearance by 15cm.

The material flows into the machine via the 880mm diameter and eight-row feed rotor which measures 1,910mm in width. The helically arranged feed tines make for a smooth rake and take out any peak torques. 22mm wide Hardox plates suggest a long service life and precise cuts, because they also serve as counter blades for the 48 blades. The theoretical chop length is 37mm and increases to 74mm when 24 blades are in work. The blades are operated hydraulically and the so-called blade group control system moves 0, 24, 24 or 48 blades into and out of the crop flow, each blade being individually protected from overload. The blade cassette pulls out and swings to the side for changing or grinding the blades. The latter can be done by the optional SpeedSharp system (see agrarheute 03/2019).

THE CLEVER POWERBELT TECHNOLOGY

The Powerbelt is a donation from the Krone forage harvesters to the ZX where it replaces a spur gearbox. The 50rpm for the rotor are generated by the two-speed planetary gearbox that is integrated inside the rotor. This reduces the 1,200rpm that are supplied by the main gearbox and provides 2,800Nm for the rotor. Further advantages of the Power-



1 The pick-up is 2.12m wide and is depth controlled by wheels and suspended electro-hydraulically.

2 The poly-V Powerbelt is a simple but efficient way of driving the rotor, the speed of which is reduced by an integral planetary gearbox.

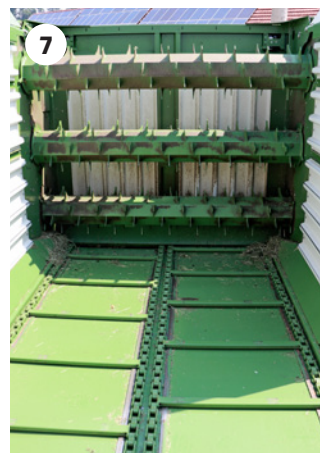
3 The feeding passage is 1.91m wide. Hardox plates on the feed tines serve as counter blades for the blades.

4 The blade cassette is dropped by pressing a button and is then pulled out to the side for blade changes.

5 The machine unloads the material in very uniform mat on the clamp.

6 The discharge rollers are powered by a heavy-duty 1in chain.

7 Two hydromotors drive the two chain systems. The floor is made from steel.



belt include its slim and space-saving design and the fact that it absorbs peak loads.

Krone was one of the first manufacturers who implemented a sloping floor which eases the crop flow into the load area by lowering the front end by 350mm on the ZX, which suggests a reduced input power and better crop compression inside the load area.

The chain-and-slat floor consists of four flat-link chains running on the steel floor. They are driven by a shaft which in turn is powered by two hydromotors, one on either side. To clear out the machine, the chains are automatically switched into fast mode as a pressure sensor on the hydraulic chest activates the two motors – a feature that eases operator strain. But before the fast advance mode is activated all material has to be unloaded.

This is done in a controlled way by 407mm rollers which are activated after the rear door is opened. The two rollers at the bottom revolve at a higher speed than the top roller, a detail that ensures the material is discharged at a consistent rate and in a uniform mat. The bottom roller moves in a floating bearing arrangement and signals to the electronic system when the machine is filled to capacity.

CONTROLLED BY ISOBUS

The job controller is an in-house Krone development which allows the manufacturer to implement a number of new features such as the pick-up suspension. It goes without saying that the controller is Isobus-compatible. Although we operated the machine from the Delta terminal it is also compatible with any other ISOBUS terminal.



The Delta terminal makes for convenient operation of the ZX which also follows any other ISOBUS-compatible terminal.

The pulses that are emitted by the sensors on the bottom roller at the rear and on the headboard are processed by the Power-Load system which uses them to control the floor chains and the headboard. The sensor at the bottom of the headboard measures the pressure that the material is exerting on the headboard as the load area is filling up whereas the sensor at the top detects the filling level. These two sensors make it possible to implement various modes that help operating the machine in different crops and wilting levels for optimum compression or higher volumes. The chain-and-slat floor is controlled automatically and continuously and unloads the material in a smooth and consistent flow.

Down on the running gear, we find factory-fitted tandem axles running on 800in wheels. They are suspended hydro-pneumatically by a system that controls each side separately for extra

roll stability. The system works basically to the principle of a Boogie axle: when the leading wheel moves up the oil flows into the rear cylinder, thereby pressing the wheel more powerfully to the ground and allowing the machine to manage obstacles with ease. The hydraulic forced steering system on the rear axle ensures the wagon treads carefully behind the tractor and avoid scuff-

ing. Of course, the system is also beneficial for safe road transport. Locking the axle is now consigned to the past and ZX reverses automatically in the correct direction.

SUMMARY

ZX from Krone is a powerful forage wagon that is made for professional users. The pick-up and the feed rotor are designed to handle high volumes of grass. An innovative detail on the rotor is its drive that consists of a poly-V belt and a planetary gearbox inside the rotor. Its full-steel body makes the machine also a good silage trailer. The discharge rollers are useful if the wagon unloads on the clamp where the rollers discharge the material in a consistent mat for time-saving compacting. Boasting many auto features, the machine is a doddle to operate. Our contractor Peter Goldbrunner, too, is very happy with his ZX 430 GD that has clocked 600 hauls by now



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MODEL LINE-UP OF KRONE ZX 430 GD SELF-LOADING AND FORAGER-FILLED WAGONS

PLUS & MINUS

- + Steel sides increase versatility
- + The poly-V belt is a clever solution for driving the feed rotor
- + The hydraulic pick-up automatically adapts to the current forward speed
- + 48 blades give a nominal 36mm chop length
- + Axles with hydro-pneumatic, anti-roll suspension
- The steel structure increases the kerb weight

**Minimum use:
307h/year**

$$MU = \frac{Fc}{rc - vc} = \frac{€14,444}{€52 - €5} = 307 \text{ h/year}$$

Explanation

MU	Minimum use
Fc	fixed costs/year: €14,444/year (= 10% off the purchase price)
Vc	variable costs/ha: €5/h (wear, service)
RC	Rental costs: €52/h

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Technical data

Capacity (DIN)	43 m ³
Pick-up width / number of blades	2,125 mm / 48
Central blade group control system	0/24/24/48
Min. nominal chop length	37 mm
Feeding passage width	1,910 mm
No. of discharge rollers	3
Min. tractor input / pto speed	155 kW (210 hp) / 1,000 rpm
PTO speed	1,000 rpm
Compatible with load sensing systems	Yes
Control box	ISOBUS tractor terminal

Dimensions and weights

Length x width x height	9.84 m x 2.95 m x 3.99 m
Platform height	1.70 m
Track width / tyres on tandem-axle wheels	2.05 m / 800/45 R 26.5
Tongue load	4 t
Kerb weight / Total weight	12.1 t / 24 t

Prices

Base price	€142,110
Tyre size (80/45 R 22.5)	Series
Delta terminal	€2,325
Total price	€144,435

Source: Manufacturer information, list prices excl. VAT