PRODUCT CATALOGUE

Czajkowski
STRIP-TILL

CZAJKOWSKI MASZYNY Sp. z o.o.

ADDRESS: Sokołowo 1C, 87-400 Golub-Dobrzyń
TEL: + 48 570 135 960
TIN: 503 00 79 262
REGON: 364665016

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EN-09-25

PRODUCT CATALOGUE

Czajkowski
STRIP-TILL

STRIP TILL N°1 ON THE MARKET!

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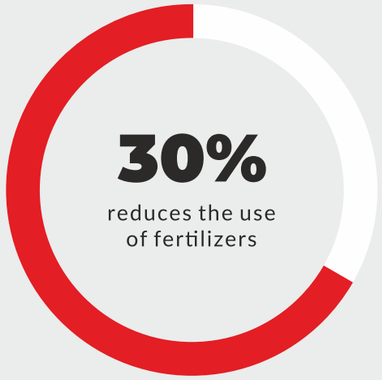
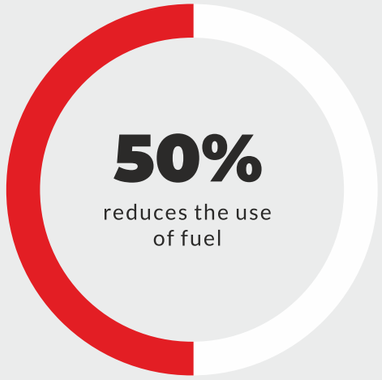
Czajkowski Strip Till Unit
offers many financial benefits





NEW DIMENSION OF AGRICULTURE

STRIP TILL

Strip till is a system of land cultivation based on deep, vertical scarification of narrow soil strips, in which mineral fertilizers and plants are sown.
At the same time, interrows are left unscarified.

Strip till lets you obtain and keep beneficial soil properties, increases efficiency and profitability of plant cultivation and at the same time protects the environment.

Typical features of strip till:

- Soil cultivation only in rows
- Crop protection –scarified and aerated soil
- Benefits of direct sowing – soil protected against erosion
- Significantly reduces costs
- Reduces CO_2 emission between 7% to 35%
- Uses localized vertical soil fertilization
- Reduces time spent on cultivation

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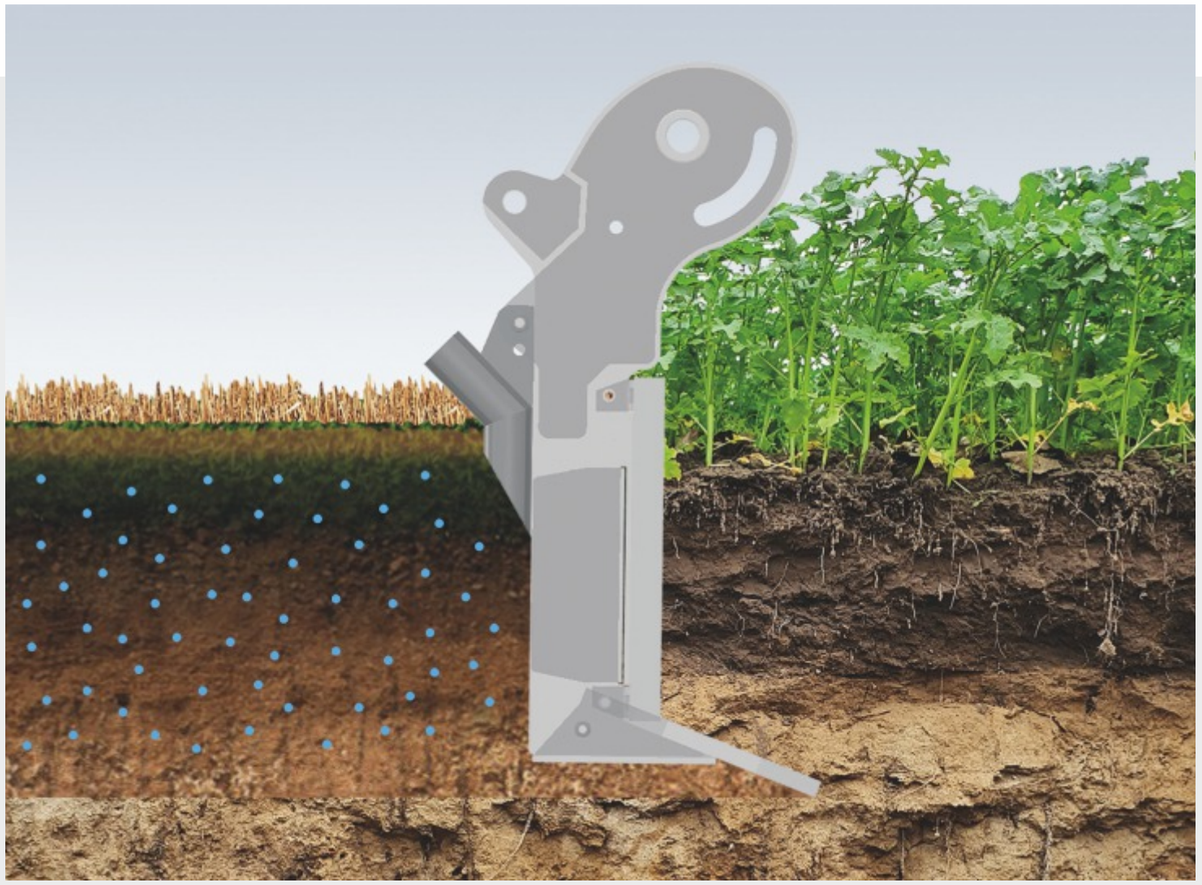
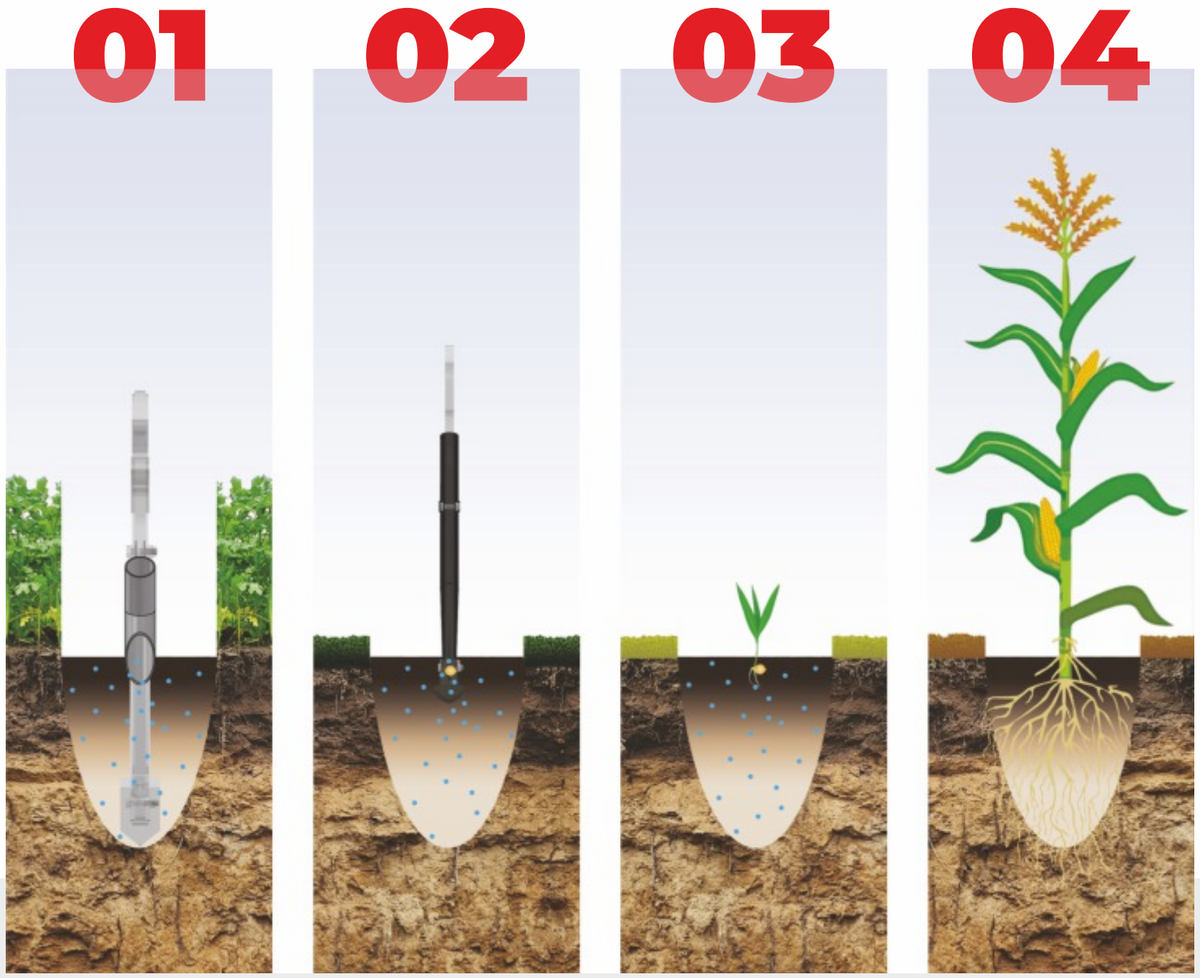
FERTILIZATION AND SOIL STRUCTURE IN STRIP TILL

Soil structure is determined on the basis of the shape, size and durability of aggregates formed by soil particles. It is one of the basic soil properties – crucial both from the ecological and practical point of view. In natural soils, structure mostly depends on vegetation, water conditions, bedrock and the climate. Permanent fine aggregate structures – coprolite or gravelly - are the most beneficial for the correct growth of most plants.
They facilitate rooting and life of soil fauna. Moreover, they provide optimal air and water conditions and make it easer for rainwater to sink in, thus partially protecting the soil against erosion.
A well-developed soil structure resembles a sponge characterized by a complex particle system (aggregates) and canals created by roots and soil organisms.

Human activity in agriculture is the key factor determining both the type and quality of the structure – including the types of the used agrotechnical treatments.





Ploughing is the main cause of significant structure transformations. It makes surface layers of the soil strongly aerated and dried out, which worsens the conditions needed for soil organisms to develop (e.g. earthworms, microorganisms), increases the pace of humus decomposition and leads to its lower content. Soil exposure is also responsible for intensified water and air erosion, further worsening of the soil in terms of organic component content and decreased biological activity. Mass (clay soils) and low-aggregate (sandy soils) structures are created as the outcome of the above-mentioned changes. Due to the low water resistance of such an aggregates, the soil surface is easily caked and capped.

Cultivations with limited ploughing – including strip till – improve the overall condition of agricultural soils. Such soils are characterized by regeneration of fine aggregate structures and increased humus accumulation, reduction of surface runoff by as much as 92% and lower soil loss by 95% (in comparison to ploughing), multifold increase in earthworm population and general biological activity. Along with the development of a favourable soil structure, its natural functionality and resistance to degradation is brought back.

Marcin Świtoniak PhD, professor at **UMK** in Toruń

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TECHNOLOGY IN HARMONY WITH NATURE

Unquestionable climate changes and the related more frequent droughts connected to wind erosion favour the use of technologies, which maintain moisture in the soil for the longest time possible.

That's why it is worth protecting the soil against water and organic matter losses. It's also worth taking care of an increased activity of biological life in the soil, including earthworms, its loosening, improved structure and reduced compactness. **Strip till** allows the correct level of hydration to be maintained.

Mulch allows water to skin into the ground, so that the soil is kept moist for a longer time. There's no caking and erosion - water and wind. Water reaches the roots through tunnels made by earthworms.

The **Czajkowski ST** technology meets the challenges of modern agriculture by ensuring optimal conditions for cultivation. Scarification, soil fertilization and sowing are reduced to a single drive through the field. Ecological aspects change the approach towards agriculture and cultivation.

Czajkowski
STRIP-TILL

SUGAR BEET

Sugar beet cultivated in rows of 45 mm takes up 22% of the field area. A question comes to mind, is the cultivation of interrows necessary?

The technology of strip till provides all favourable conditions for the correct growth of plants, where the main foundation is the root.

Fertilizers used directly under the plant are more effective for plant growth. Additionally, the application of fertilizers under the plant during the spring season in sugar beet cultivation stimulates the root to grow into the soil.

With the use of universal 60 mm wide chisels, which work at depths to 35 cm, the soil is properly scarified and aerated. This way, the temperature of the cultivated soil strip increases more quickly and that provides proper conditions for rapid growth of plants.

By using the Czajkowski ST technology, sugar beets build their root mass without excessive root exposure over the soil surface. The final outcome is that beets don't fall over while harvesting them, which is especially visible at the edges of the field. The remaining 80% covered by a layer of mulch serves as a storage for water, which doesn't evaporate.

The structure of the uncultivated interrows has higher soil carrying capacity and that results in – in unfavourable autumn moisture conditions – harvest without "ruts."

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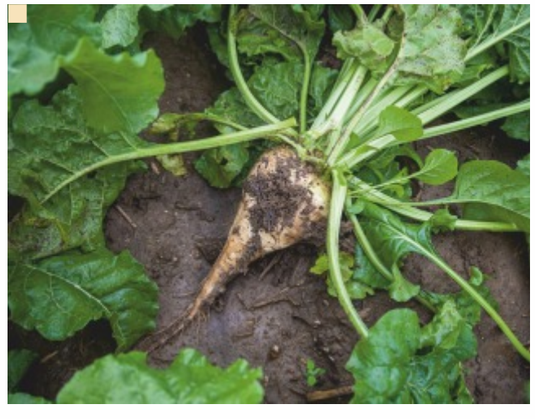

SUGAR BEET
STRIP TILL

GRAINS

Despite many voices opposing the application of strip till to grains, we'd like to emphasise that plants need good soil scarification and aeration because, contrary to popular belief, the condensed root system is not a shallow root system and cultivation without deep scarification simply does not work in the long term.

Air in the soil is needed in order for grains to give satisfactory yield. Grains, By using the technology of wide strips and narrow interrows, grains demonstrate better tillering around their own axis and do not compete with each other within the row. This way the field demonstrates better aeration.

Field experiments have shown that the surplus of yield comes to 5,1% while the surplus of hay comes to 14,7% more for strip till than in the case of ploughing. The advantage of using a cutting hoe coulter over other types of coulters is that the seed is always placed in a clear seedbed.

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GRAINS
STRIP TILL

RAPESEED

Winter rapeseed as a plant with a tap-root system reacts in a particularly good manner to the strip till technology. Such technology allows optimal agrotechnical deadlines of rapeseed sowing to be kept. Another important advantage is even emergence and a steady growth during vegetation.

Cultivation of winter rapeseed starts from the correct harvest of forecrop. Well-cut post-harvest material and even work on the whole width of the harvester is the first step to success. It is also important to remember about cutting the forecrop at the lowest point possible. If needed, the field can be prepared with a single drive using a disc harrow – as shallow as possible – or a mulch harrow.

With the CZAJKOWSKI ST technology, cultivation, soil fertilization and sowing are reduced to a single ride through the field. Plants are sown in the scarified soil strip with the PS attachment or a precision seed drill. It is important to remember about choosing the right kind and reduction of the planted material. The best types are winter rapeseed hybrids, which are perfect for sowing in wide spacing settings thanks to their strong side shots responsible for nearly 70% of the yield. Reduction of the planted material serves to decrease the pressure put on plants in a single row. It is also crucial not to forget about the reduction of starter fertilizers, because they should be used only where plants are sown in such a way, which does not damage the seedlings due to excessive salinization of the cultivated strip.

Despite economic benefits such as the reduction of the planted material (20-30%), reduction of starter fertilizers (20-30%), reduction of fuel consumption and reduction of work time needed to grow winter rapeseed, a vital aspect is the mulch left on the surface, which limits the growth of weeds and vertical non-blending scarification of the soil, which in turn saves water needed for plant growth. It's also worth mentioning that during winter with low rainfall, rapeseed sown with the use of mulch is less exposed to freezing and cold wind burning.

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RAPESEED
STRIP TILL

CORN

Corn cultivated in wide rows takes up 13% of the field area. A question comes to mind, is the cultivation of interrows necessary?

The technology of strip till provides all favourable conditions for the correct growth of plants, where the main foundation is the root. Fertilizers used directly under the plant are more effective for plant growth.

When comparing this system to the application of fertilizer with a disc coulter to the depth of 10 mm, the use of fertilizer is more efficient and the root system is more developed. The use of dedicated 80 mm wide corn chisels, which reach the depths of up to 35 cm, the soil is scarified and aerated. This way, the temperature of the cultivated soil strip increases more quickly and that provides proper conditions for rapid growth of plants. The remaining 87% covered by a layer of mulch serves as a storage for water, which doesn't evaporate. The structure of the uncultivated interrows has higher soil carrying capacity and that results in – in unfavourable autumn moisture conditions – harvest without "ruts."

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CORN
STRIP TILL

PULSES, HERBS AND HEMPS

Pulses need a “breathing” soil. The most important aspect of soil cultivation for pulses is the principle to cultivate it in such a way, which doesn't damage the soil structure – without silts and pollination.

In comparison to the conventional ploughing, field experiments have shown that from among pulses, it is field bean and narrowleaf lupin, which have reacted with the highest surplus of seed yield in all of the used strip till variants. Yields of sugarsnap peas, white lupin and soybean have been at a level similar to conventional ploughing.

Minimum till and strip seeding can be successfully used when cultivating field bean, narrowleaf lupin, white lupin and soybean because it doesn't lower their yield. Strip seeding, as environmentally friendly, compliant with the rules of sustainable agriculture and integrated protection of plants, can be considered an agrotechnical factor, which elevates the consequences of droughts occurring during the vegetation of pulses.

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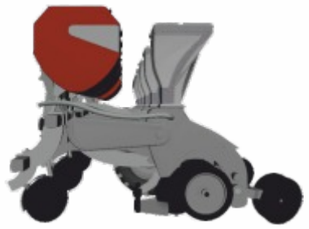
PULSES, HERBS AND HEMPS
STRIP TILL

ONE MACHINE, MANY FEATURES

+

OR



DISC HARROW

+

PLOUGH

OR

MULTIBEAM CULTIVATOR

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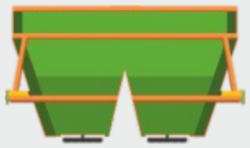

BROADCAST SPREADER X2

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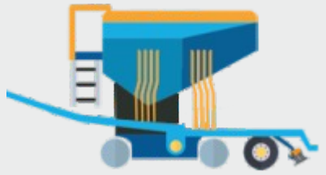

SEED DRILL

OR

PRECISION SEED DRILL

+

WORKING SECTION of Czajkowski ST

Advanced construction.

Essential features:

The section system and the off-set roller minimize the effect of horizontal compression of the soil structure and eliminates the clogging effect

Vertical shape of sections working in the soil eliminates the blending effect

Adjustment of working depth without tools

Non-stop hydraulic or mechanical safeguard at each component of the machine

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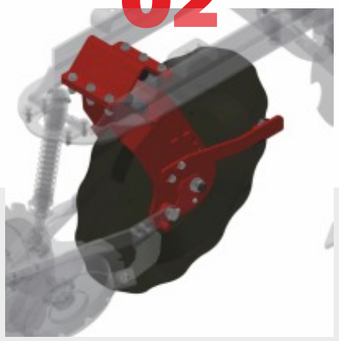
6 STEPS TO PLANT GROWTH

01

SPREADING AND BREAKING DISCS
They clear the soil strip from harvest residues and mulch

02

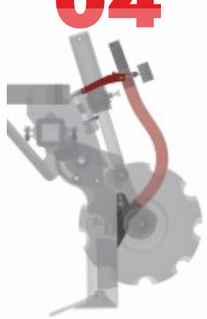


CORRUGATED CUTTING DISC
Cuts the soil at the depth of 12 cm and puts the plow frame into the soil in a non-invasive way

03

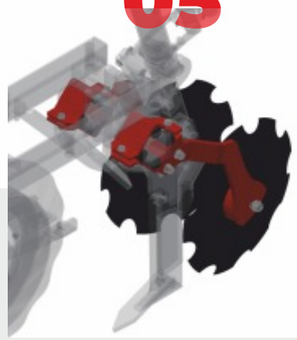
VERTICAL SCARIFYING AND AERATING PLOW FRAME
Works at the depths of up to 35cm, its shape doesn't cause soil blending

04



NOZZLE FOR FERTILIZER APPLICATION
Ensure precise application of one or two types offertilizer along the soil profile

05

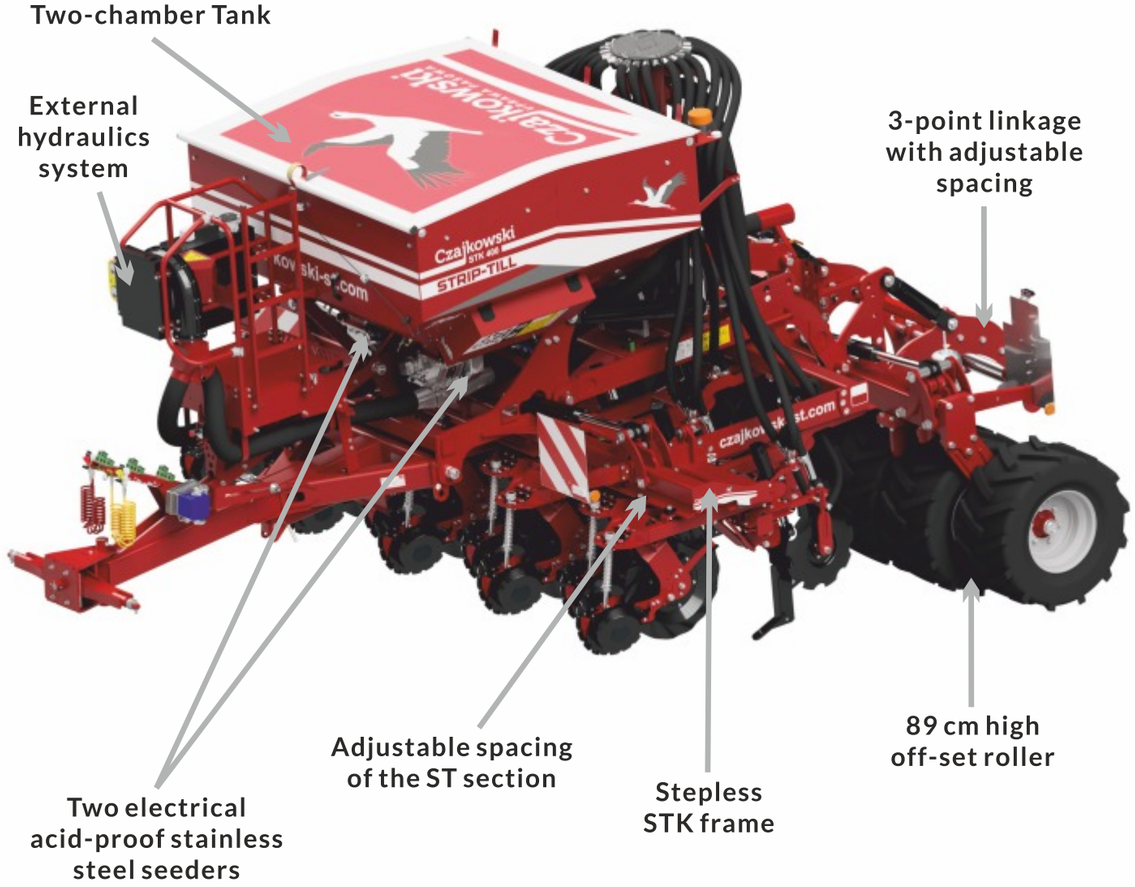


CLOSING AND COMPACTING DISCS
Maintain the loose layer of the soil inside the cultivated soil strip

06

OFF-SET ROLLER
Effectively compacts the soil and evens its surface while the offset system eliminates the clogging effect

CZAJKOWSKI STK
300 / 400



STK 300

STK 400

TECHNICAL SPECIFICATION

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Spacing	STK 300	STK 400
8 x 37,5 cm (grains, rapeseed)	●	●
6 x 45 cm (beet, rapeseed)	●	●
6 x 50 cm (soybean)	●	●
4 x 75 cm (maize, sunflower)	●	●
6 x 70 cm / 6 x 75 cm (maize, sunflower)	○	●
9 x 44,4 cm (grains, rapeseed)	○	●
7 x 44,4 cm (grains, rapeseed)	●	●

○ - option Plus

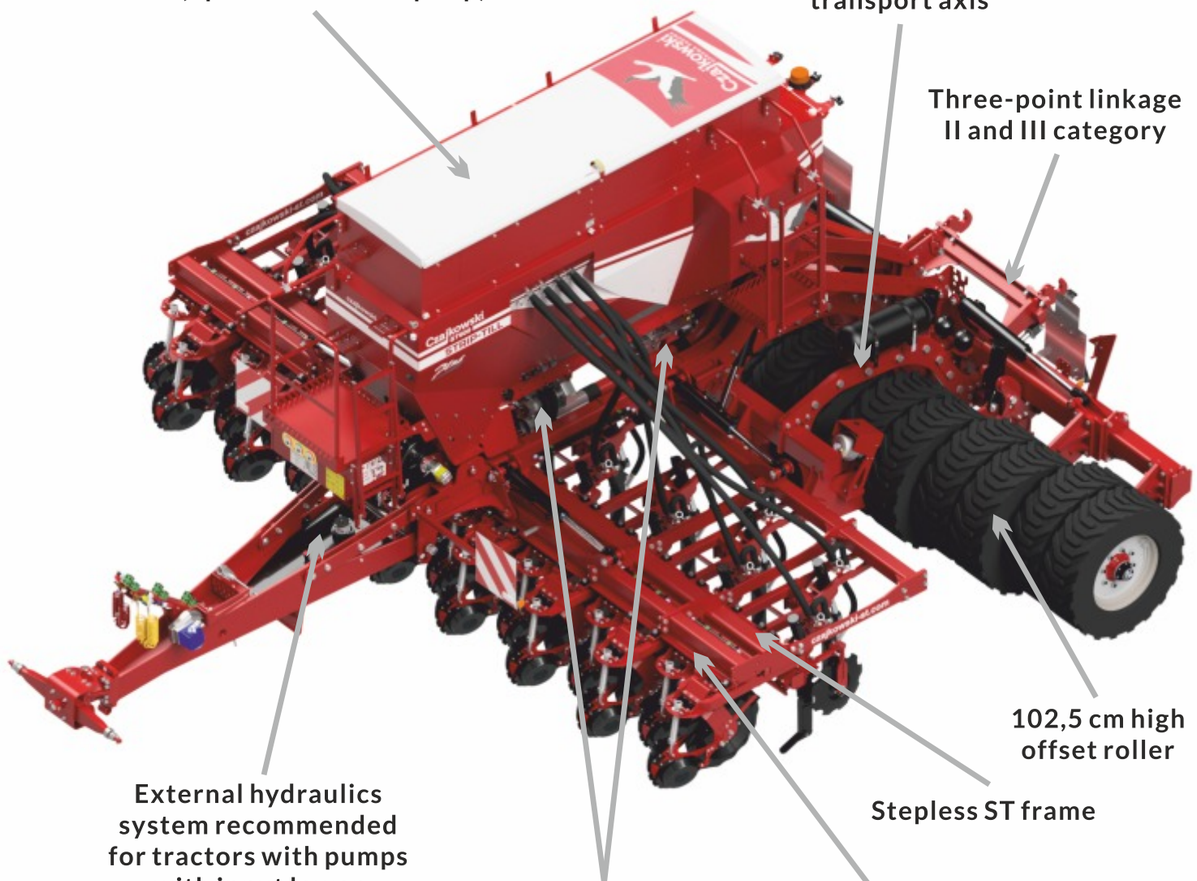
Tank capacity (l)	2 x 1400	
Tank filling height (m)	2,6	
Number of scarifying sections	from 4 to 9	
Spacing of scarifying sections (cm)	stepless	
Working depth (cm)	from 20 to 35	
Minimum power supply (HP)	160	180
Roller Ø (cm)	89	
Seeders	2 x electrical	
Hydraulic connectors	3 or 4 pairs + slow flow	
Rear three-point linkage (lifting)	cat II or cat. III (3500 kg)	
Rear PTO	hydraulic	
Power supply	12 V	
Lights	LED	
Video camera (pcs.)	from 1 to 2	
Hydraulic filter (pcs.)	2	
Hitch type	beam, cat. III	
Transport width (m)	3	
Transport height (m)	3,1	
Transport length (m)	6,4	
Weight (kg)	4500-5500	5000-6500

CZAJKOWSKI ST
300 / 400 / 450 / 600

60/40 two-chamber split tank or 40/60 of 3900 l capacity (optional 1000 l top cap)

Hydraulic shock absorbers for the transport axis

Three-point linkage II and III category



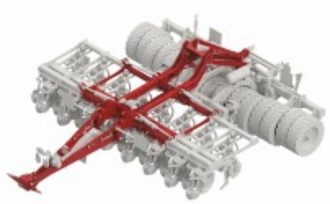
102,5 cm high offset roller

Stepless ST frame

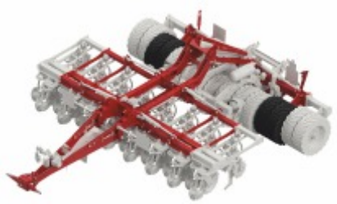
External hydraulics system recommended for tractors with pumps with input lower than 140 l/min

Two electrical acid-proof stainless steel seeders

Adjustable spacing of the ST section



ST 300



ST 400/450

ST 600

TECHNICAL SPECIFICATION

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Spacing	ST 300 8R	ST 400 10R	ST 450 12R	ST 600 14R	ST 600 16R
8 x 37,5 cm (grains, rapeseed)	●	●	●	●	●
6 x 45 cm (beet, rapeseed)	●	●	●	●	●
6 x 50 cm (soybean)	●	●	●	●	●
4 x 70 cm / 4 x 75 cm (corn, sunflower)	●	●	●	●	●
6 x 70 cm / 6 x 75 cm (corn, sunflower)	○	●	●	●	●
10 x 40 cm (grains, rapeseed)	○	●	●	●	●
12 x 37,5 cm (grains, rapeseed)	○	○	●	●	●
12 x 45 cm (beet, rapeseed)	○	○	○	●	●
12 x 50 cm (soybean)	○	○	○	●	●
14 x 42,8 cm (grains, rapeseed)	○	○	○	●	●
8 x 70 cm / 8 x 75 cm (corn, sunflower)	○	○	○	●	●
16 x 37,5 cm (grains, rapeseed)	○	○	○	○	●

○ - option Plus

Tank capacity / with top cap (l)	3900 (60%/40% or 40%/60%) / 4900 (60%/40% or 40%/60%)				
Tank filling height / with top cap (m)	2,8 / 3,2				
Number of scarifying sections	from 4 to 8	from 4 to 10	from 4 to 12	from 4 to 14	from 4 to 16
Spacing of scarifying sections	stepless				
Working depth (cm)	from 20 to 35				
Minimum power supply (HP)	200	250	280	320	360
Roller Ø (cm)	102.5				
Seeders	2 x electrical				
Hydraulic connectors	4 or 5 pairs + slow flow				
Rear three-point linkage (lifting)	cat II or cat. III (4500kg)				
Rear PTO	hydraulic				
Power supply	12 V				
Hydraulic filter (pcs.)	2				
Hitch type	beam, cat. III				
Transport width (m)	3				
Transport height (m)	3,90				
Transport length (m)	8,40				
Weight (kg)	7900-10300	9100-11500	9550-12000	10000-1300	11400-14000

SEEDING SECTION of Czajkowski PS

Advanced construction.

This machine has been constructed for seeding of grains, rapeseed, field peas, hemps, soybeans and other plants, in case of which broadcast seeding is possible .

Essential features:

The section is suspended on a parallelogram.
It independently copies the terrain and precisely maintains the pre-set working depth

Seeds are placed on the pre-set depth and in a clear seedbed

Sections in the off-set system

Seed flow control on each section via a set of sensors, which provide up-to-date information about seeding

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5 STEPS TO SEEDING

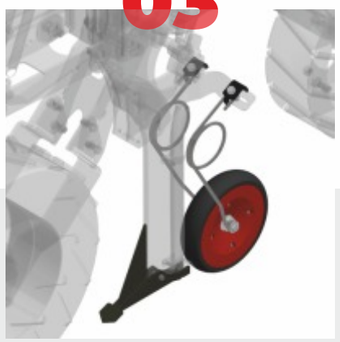
01

SUPPORT WHEEL
Ensures independent copying of the terrain of each seeding section

02

SEEDING PLOW FRAME WITH RAPESEED OR GRAIN COULTER
The system of a hoe coulter ensures even cutting of the soil and placement of seeds in a clear seedbed

03



RUBBER COMPRESSION WHEEL FOR RAPESEED SEEDING
Compresses rapeseed seeds in the seeding furrow so that they are in proper contact with the soil thus providing the even emergence effect

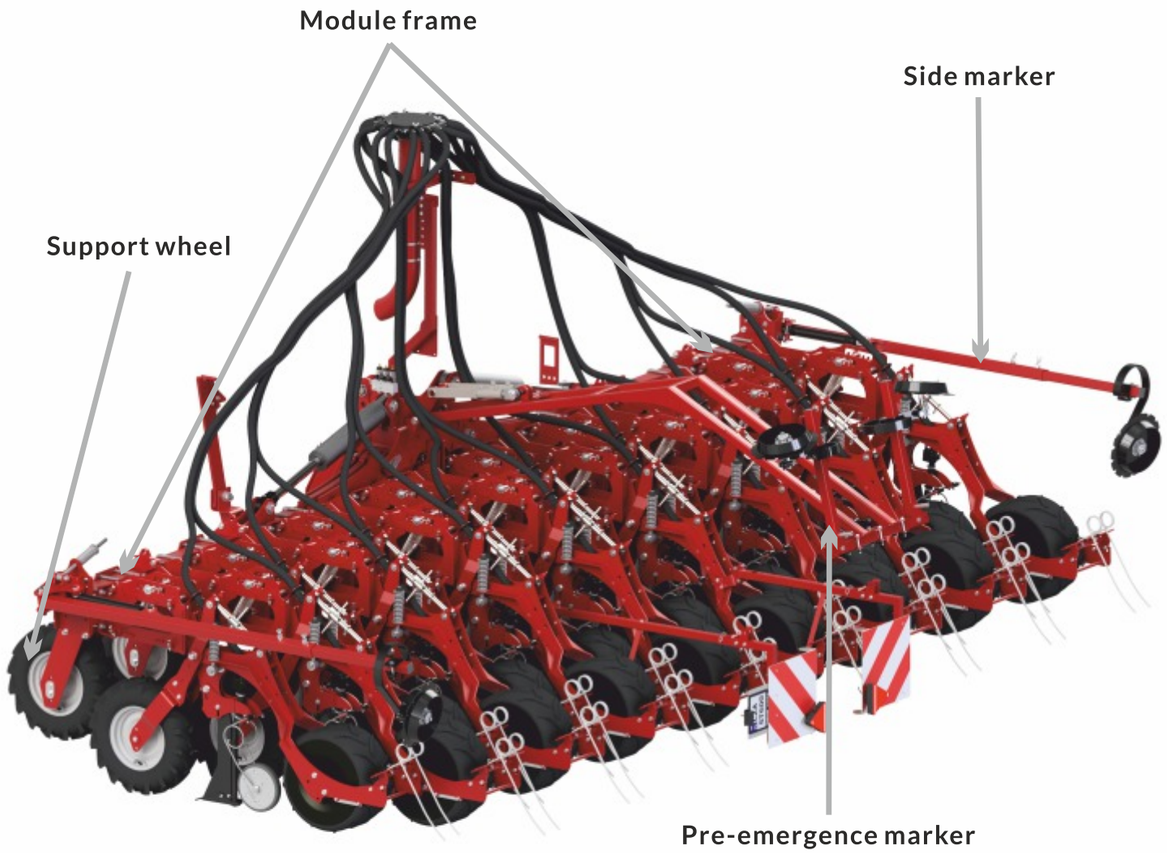
04

OPENWORK WHEEL
Maintains the pre-set seeding depth and leaves a gravelly soil structure above the seeds

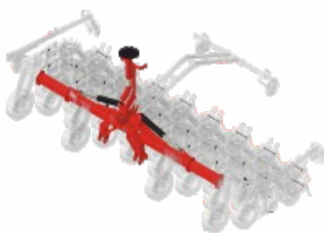
05

POST-SEEDING FURROW
Ensures good covering of the seeds and evens the soil surface in the strip and/or interstrip

SOWING SECTION
of Czajkowski PS



PS 300



PS 400/450

PS 600

TECHNICAL SPECIFICATION

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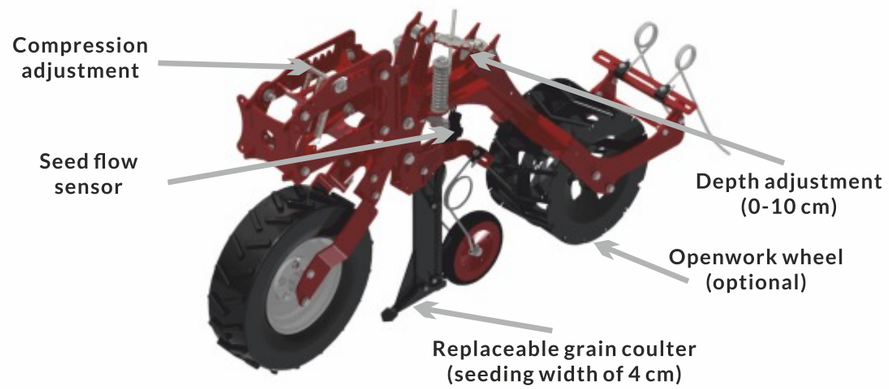
Spacing	PS 300S 8R	PS 400SH 9R	PS 300 8R	PS 400 10R	PS 450 12R	PS 600 14R	PS 600 16R
6 x 45 cm (2,7 m)			●	●	●	●	●
8 x 37,5 cm (3,0 m)	●	●	●	●	●	●	●
10 x 40 cm (4 m)			○	●	●	●	●
12 x 37,5 cm (4,5 m)			○	○	●	●	●
12 x 45 cm (5,4 m)			○	○	○	●	●
14 x 42,8 cm (6 m)			○	○	○	●	●
16 x 37,5 cm (6 m)			○	○	○	○	●
7 x 42,8 cm (3 m)	●	●					
9 x 44,4 cm (4 m)	○	●					
Number of seeding sections	from 6 to 8	from 7 to 9	from 6 to 8	from 6 to 10	from 6 to 12	from 6 to14	from 6 to16
Spacing of seeding sections (cm)	37,5; 44,4	37,5; 44,4	37,5; 40; 42; 45				
Seed flow sensors	○	○	○	○	○	○	○
Markers	○	○	○	○	○	○	○
Side markers	○	○	○	○	○	○	○
Grain seeding system	●	●	●	●	●	●	●
Rapeseed seeding system	○	○	○	○	○	○	○
Openwork wheel of the PS section	○	○	○	○	○	○	○
Rubber wheel of the PS section	○	○	○	○	○	○	○
Weight (kg)	2000	2500	2300	3000	3300	3750	4000

○ - option Plus



Czajkowski PS Seeding Section

WORKING ELEMENTS
Czajkowski

The tine and blade are the key working elements used in our machines. They are intended for efficient loosening and penetration of the soil, and their refined design has a huge impact on the efficiency of the machine and the reduction of diesel consumption.

TINE

	STANDARD	PAD WELDED	SINTERED CARBIDE
45 mm rapeseed, soybean			
60 mm cereals, rapeseed, sugar beet			
80 mm maize, sunflower			

Tine - we offer standard tines made of high-strength Strenx steel, tines additionally reinforced with hard-facing and carbide tines.

BLADE

	STANDARD	SINTERED CARBIDE
Rotary and self-sharpening blade		

Blade - rotates 180 degrees for longer life.

ROTATING TINE COVER

SOWING COULTER

PS section Narrow rapeseed coulter 4 cm 	**PS section** Wide grain coulter 32 cm 

Sowing coulter – lifts mulch and harvest residues, which guarantees a clean seed bed in contrast to the disc coulter.

Czajkowski STRIP-TILL

YOUR NOTES

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ISOBUS – available as standard on Czajkowski

Our solutions are fitted as standard with an Isobus connector using Muller Elektronik® and MC Electronics® solutions that work with any Isobus terminals.
There is also a dedicated range of Trimble® terminals, which can easily be upgraded to parallel guidance functions.

	GFX-350™ Display 17,8 cm	GFX-1060™ Display 25,6 cm	GFX-350™ + NAV-500™	GFX-350™ + NAV-900™	GFX-1060™ + NAV-500™	GFX-1060™ + NAV-900™
VT - Virtual Terminal	☑	☑	☑	☑	☑	☑
TC - Task Control	☒	☒	☑	☑	☑	☑
VRA – variable dosage	☒	☒	☑	☑	☑	☑
Manual navigation	☒	☒	☑	☑	☑	☑
Extension for automatic guidance	☑	☑	☑	☑	☑	☑

Virtual terminal (VT/UT) – display screen of connected equipment Task Control – TC – control ofsprayer/seeder/ spreader sections VRA – upload of variable application maps – requires Task Control to use maps.

NOTE: If your tractor is equipped with an ISOBUS terminal by other brand, e.g. John Deere, Case, New Holland, Claas, AGCO, make sure that it has the following functions activated: Virtual Terminal, Tasc Control, VRA (Prescription Map). We recommend consulting our technical support in advance.

NAV-500™ - guidance controller dedicated to the GFX series navigation panels. It offers signal reception from GNSS satellite systems.
Sub-meter accuracy.
Built-in controllers:
Gyroscope: 3-axis 50 Hz
Accelerometer: 3-axis 50 Hz

NAV-900™ - guidance controller dedicated to the GFX series navigation panels. It offers signal reception from GNSS satellite systems. Built-in controllers:
Gyroscope: 3-axis 50 Hz
Accelerometer: 3-axis 50 Hz
Precision levels are triggered as required
SBAS - < 1m
RTX Range Point (SAT) 15 cm
RTX Center Point 2,5 cm
RTK VRS 2,5 cm
High accuracy eliminates the need to use markers

Trimble® GFX-350™ is Trimble's easy-to-use display with AndroidTM assistant. This cost-effective solution offers excellent functionality and a simplified installation process, providing access to auto-guidance and application control for every farm. Bluetooth® and Wi-Fi connectivity, ISOBUS compatibility, creates a convenient solution for operating agricultural equipment and fertiliser/spray applications throughout the season across all equipment brands.

Trimble® GFX-1060™ - Trimble's latest 10" display improves the user experience with the power and capabilities needed to quickly and accurately perform daily farm work. Modular technology of the system allows the appropriate mixing and matching, also makes it possible to expand this solution in line with growing needs. Full ISOBUS compatibility allows the use of section automation, variable dosing, even several products at once.

Trimble® GFX-1260™ is our flagship 12" display with the performance and efficiency to handle even the most difficult and complex agricultural tasks. The 12-inch screen enables displaying the machine parameters even more clearly and working more comfortably.

Muller Elektronik

MC Electronics

Depending on your needs, our machine control system can be based on two solutions from leading global electronic solutions suppliers for agriculture.

Features	Muller Elektronik	MC Electronics
Variable seed application	☑	☑
Variable fertiliser application	☑	☑

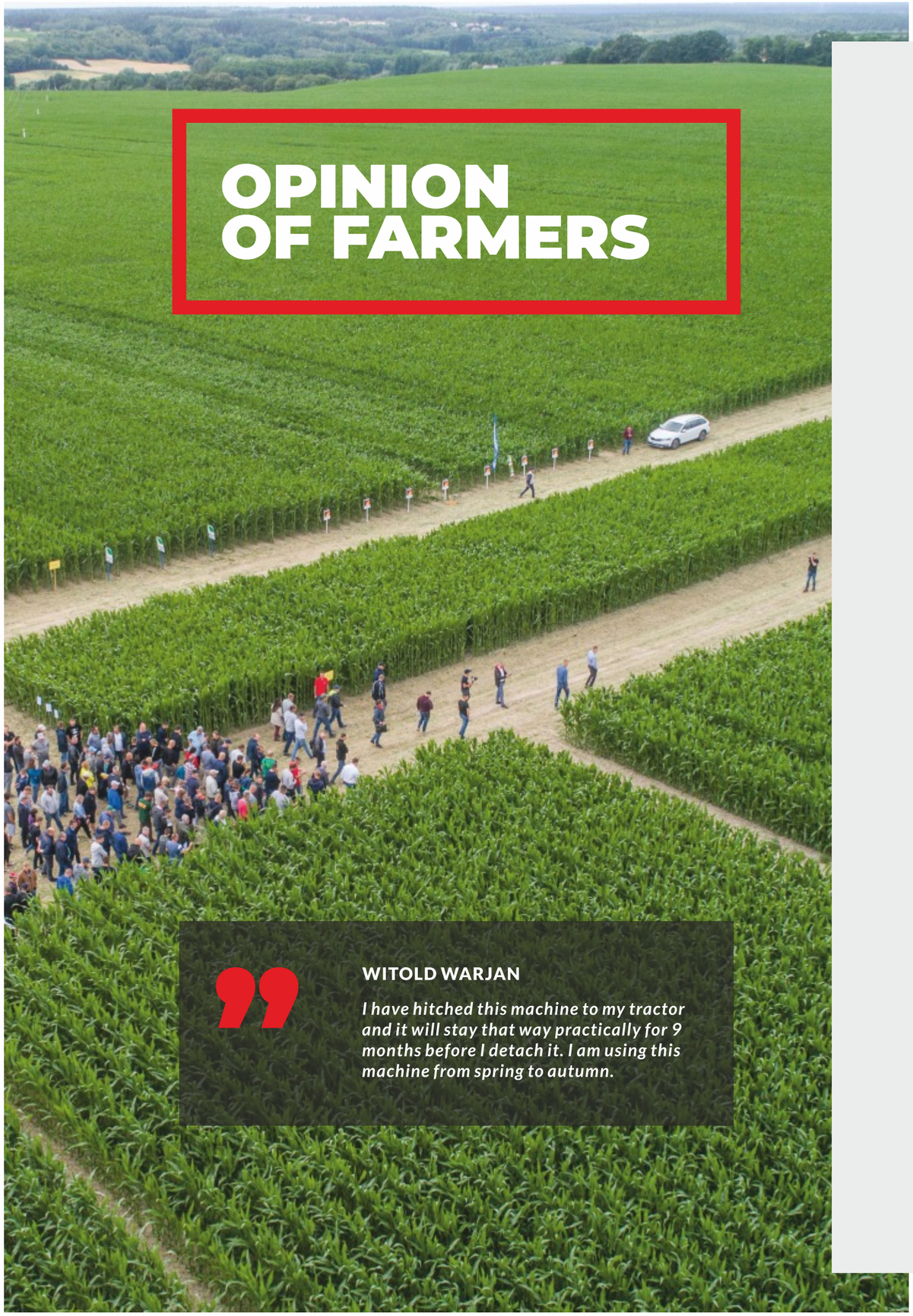
Trimble's reliable ISOBUS terminals provide clear operation of all Czajkowski machines' functions. In addition, they are compatible with variable rate application maps for fertiliser, seed and the disconnection of precision seed drill sections. And thanks to the Android operating system, the entire system can be serviced remotely using Team Viewer™.

You no longer have to wait for the service personnel, **we will solve most issues remotely**.

ROZWIĄZANIA PRECYZYJNEGO ROLNICTWA

In an era of rising agricultural production costs, our solutions allow fertiliser and seed rates to be optimised through the use of pre-loaded application maps.

If the farm already has up-to-date soil surveys and maps in digital form (SHP, XML), these can be used for performing variable seeding.



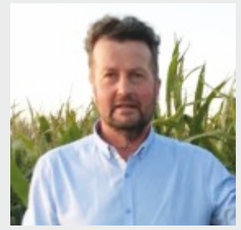
OPINION OF FARMERS

WITOLD WARJAN

I have hitched this machine to my tractor and it will stay that way practically for 9 months before I detach it. I am using this machine from spring to autumn.

DARIUSZ KLUSKO / POLAND

I have been using the Czajkowski technology for several years now and the structure of my soils has improved a lot. I have noticed a significant increase in the earthworm population. Compared to plough technology, wind erosion has been completely eliminated. I started 3 years ago with a 3 m version of the kit, and today I work with the same unit expanded to a full 6 m. This has reduced my cultivation costs by half. I value Czajkowski machines for their thoughtful design.



CHRISTIAN HINZ / GERMANY

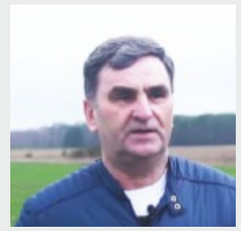
To me, Czajkowski's great strength is total flexibility. I can set different row distances (the tills), different working depths. I can use different precision seeders, so I am able to adapt to all possible working conditions.

TONY BELL / IRELAND

I bought Czajkowski STK 300 machine in Poland. With strip tillage, only a narrow strip of soil is cultivated before sowing. The main benefit is that the soil structure between the strips is intact and my Czajkowski STK 300 cuts through the intercrop. My soil porosity is much improved, as is drainage. The quality of my soil has improved tenfold since I started strip tillage, and I am saving on fertiliser and fuel. All the earthworm holes remain and pesticides use has fallen by 30%.

SŁAWOMIR TUPIKOWSKI / POLAND

After several years of experience with the Czajkowski ST technology, I must say that this method works perfectly on my light soils. Yield has not fallen, working time is reduced and costs go down.



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