Kverneland

OPTIMA

PNEUMATIC PRECISION DRILL

WHEN FARMING MEANS BUSINESS

Realising the full potential of farming is about growing and developing your business, not only your crop or livestock, but also your profit. Improve productivity and profitability by focusing on the positives and minimising disadvantageous aspects, through strong, dedicated management.

Success springs from determination and clear targets, from laying down the appropriate strategy and allocating correct investments for the future. Quality results require the right ideas and equipment. When there is work to be done, you need the optimal setup and smart solutions that support you towards an easier, more profitable way of working. You need solutions that make tough and demanding conditions less complicated.

iM FARMING

The iM Farming logo appears when the implement can be connected to our smart farming systems and accessories, essential for managing your business.

SOW

Effective sowing means speeding up when the soil is exactly right, in order to give your crop a head start.

YOUR KVERNELAND
INTELLIGENT FARMING SOLUTIONS

Choose the best farming solution for you and your land. Combine the highest possible yields with sustainability. This will start with the correct tillage. The choices you make depend on various factors and should match your specific circumstances, like soil structure, crop rotation, residue management, economic and ecological viabilities.

The choice is yours!

You must consider environmental and legal issues. From conventional methods to conservation tillage: the balance of operations at the right time has to be found to achieve high yields with the best soil condition (air, moisture, biological activity, etc.) with a minimum amount of energy, time and investment. For this, Kverneland offers a full range of intelligent farming solutions.

CONVENTIONAL TILLAGE

Conventional Tillage
- **Intensive** method of cultivation
- Complete soil inversion e.g. by a plough
- Less than 15-30% crop residues left on soil surface
- Seedbed preparation done by an active tool or special seedbed harrow
- High phytosanitary effect by reduced pressure of weed and fungi diseases - fewer herbicides and fungicides needed
- Better dry-off and faster increase of soil temperature for better nutrients absorption

CONSERVATION TILLAGE

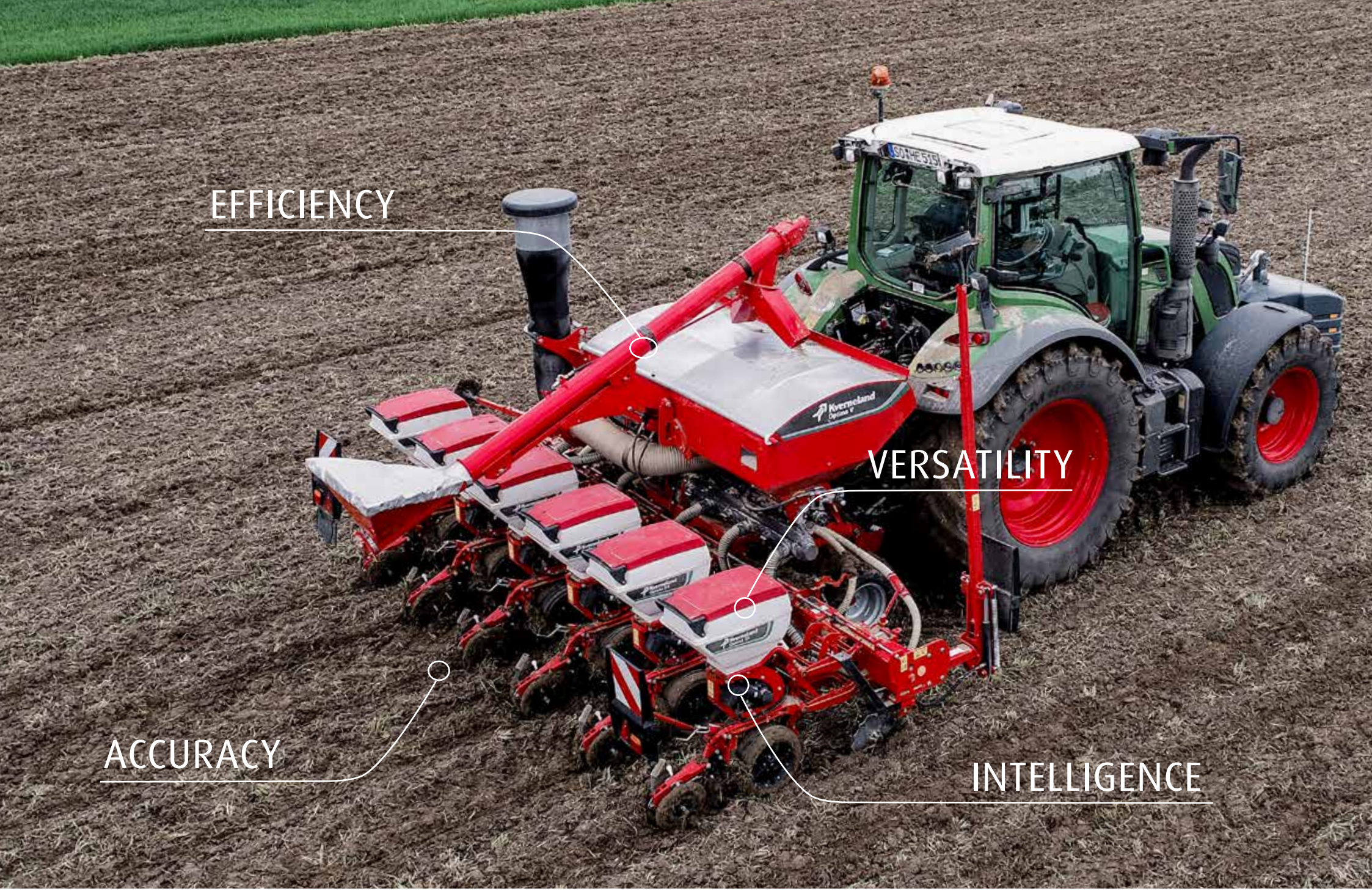
Mulch Tillage
- **Reduced** intensity in terms of depth and frequency
- More than 30% of residues are left on soil surface
- Extended repose period of the soil
- Cultivator and/or discs incorporate the crop residues within the top 10cm of soil for stable bearing soil
- Full-width tillage - seedbed preparation and seeding in one pass
- Protection against soil erosion; reduce soil loss by run-off and improve water storage capacity.
- Improvement of soil moisture retention

Strip Tillage
- **Zonal strip loosening** before or during seeding of up to 1/3 of the row width (Loibl, 2006). Up to 70% of the soil surface remains untouched
- Strip-till combines the soil drying and warming benefits of conventional tillage with the soil-protecting advantages of no-till by disturbing only the area of the soil where the seeds are placed
- Exact fertilising deposit
- Soil protection against erosion and drought

Vertical Tillage / No-Till
- **Extensive** method
- Working soil vertically avoids additional horizontal layers or density changes
- Increasing water infiltration, root development and nutrient take-up
- Plants' roots dictate the overall health of the plant, as they deliver nutrients and water throughout the season, contributing to a higher yield
- A strong set of roots make plants more resistant to wind and drought.
- Lower energy input required

CROP ESTABLISHMENT SYSTEMS					KVERNELAND'S INTELLIGENT FARMING SOLUTION					
Method					Deep Tillage (not a must)	Basic Tillage	Seedbed Preparation	Seeding	Spreading	Spraying
CONVENTIONAL	intensive	Soil coverage after Seeding	up to 15%	**Conventional** with soil inversion		  			 	  
			15 - 30%	**Reduced Till** without soil inversion						
				Mulch Seeding without soil inversion		 				
		> 30%		**Strip Tillage** stripewise loosening						
	extensive			**Vertical Tillage** shallow tillage						

CLASSIFICATION OF TILLAGE METHODS KVERNELAND (Source: adpated from KTBL)


EFFICIENCY
VERSATILITY
ACCURACY
INTELLIGENCE

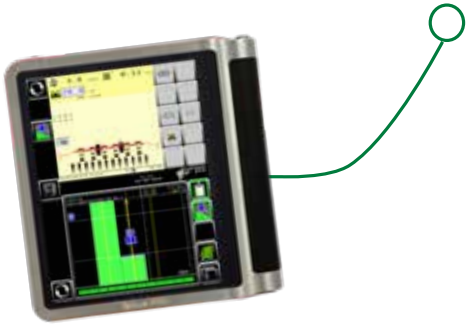
EFFECTIVE SOWING
TO MAKE SOWING PERFECT

Accuracy
The Optima is excellent in precise seed placement. You can be sure that the sowing unit follows the ground contour perfectly and the coulter forms a clean and clear furrow to ensure best seed-to-soil contact. You can seed perfectly in line and in relation to each other but also synchronised over the complete working width.

Versatility
You want a precision drill that is versatile. Ready for the various crops with smaller or bigger seeds, to sow shallow or deep. Ready to adjust to the various ways of tillage, standard or mulch seeding in different type of soils. Universal machines allow cost savings.

Intelligence
You invest in the best equipment for sowing your crop. In return you want the best results and to increase the yields significantly. With the Optima you have everything under control by ISOBUS Technology and Kverneland's Precision Farming solutions.

Efficiency
When the time is right, you want to sow immediately. The soil has to be prepared with care and the moment of sowing depends on the right conditions, like local weather. To be successful you need a precision drill that is reliable and effective.



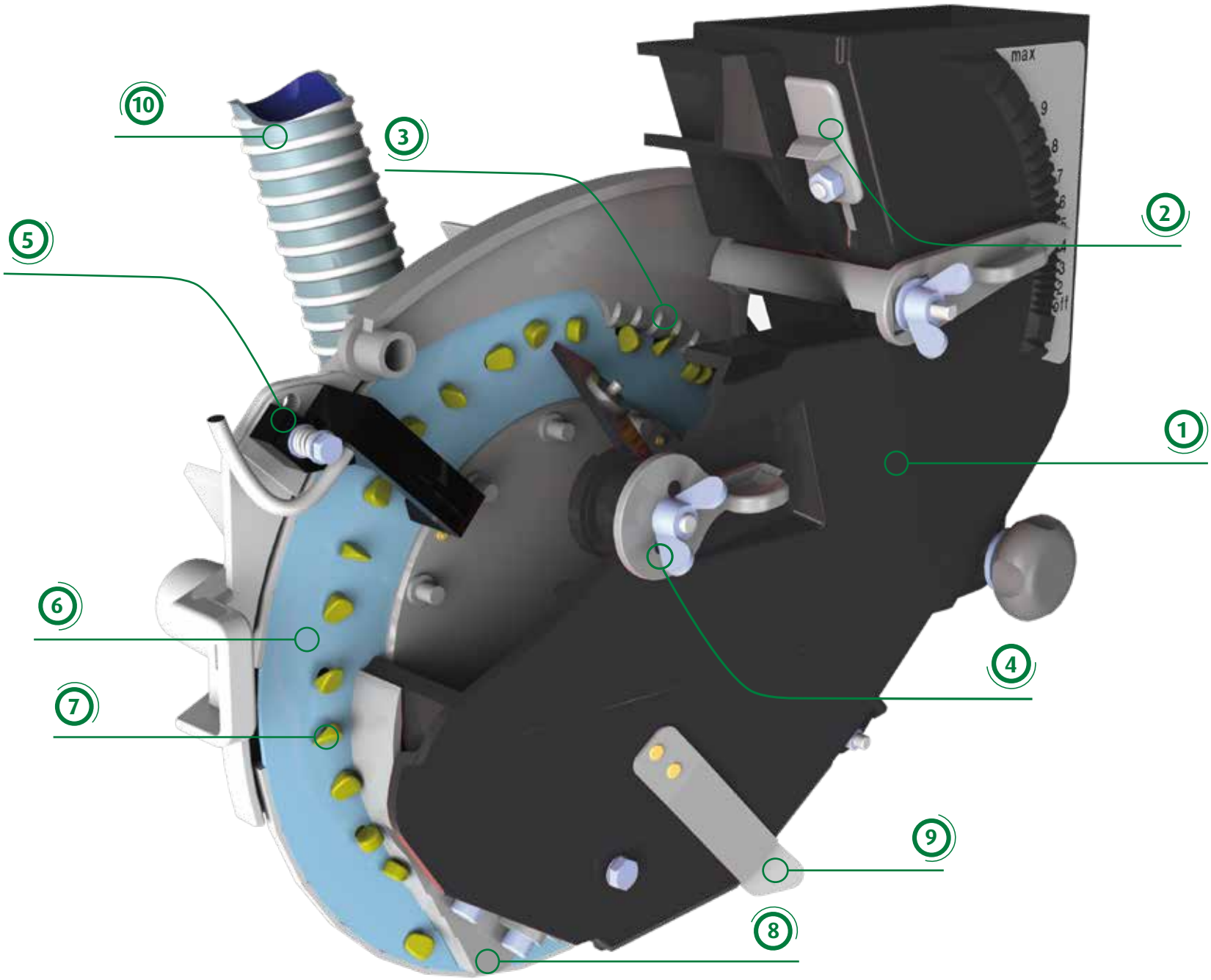
With Optima you can rely on a perfect execution.

SEEDING HEART WITHOUT SEALS
NO FRICTION, NO WEAR.

Precise singulation of small, large, round, elongated and flat seeds. Scrapers can be infinitely adjusted to suit seed size and type. During calibration the correct filling of the seed disc can be monitored via a window.

Reduced maintenance costs.

1. By using a **vacuum**, the seeds are sucked out of the stock and transported directly to the seed disc. While turning the seed disc the seeds are allocated to each of the holes.
2. The **filling height limiter** regulates the stream especially of small seeds.
3. The adjustable, **upper toothed scraper** singulates the seeds - one to each hole.
4. The adjustable, **lower scraper** ensures high precision, even of bigger seeds. It turns the seed into the correct direction. This is important for elongated seeds like sunflowers.
5. The **opto-electronic sensor** controls the correct allocation of seeds on the disc. In case of missing seeds, the sensor transfers a signal to the terminal. The opto-electronic sensor also serves as a low level sensor.
6. The **seed disc** turns on to the point of drop. The seed disc is directly fixed to the turning back of the vacuum heart. No sealing in the seedheart (only at the bearing backside) ensures a constant vacuum, an easy rotation of the seed disc with minimised friction, low power requirement and no wearing.
7. The **vacuum interruptor** closes the holes of the seed disc from the back side. The vacuum is interrupted and the seeds drop down controlled from the seed disc.
8. The **end-scraper** cleans the seed disc from seed residues, like coating or dust.
9. The **emptying flap** at the lowest point of the seeding heart enables a complete, easy emptying and cleaning of the seeding heart.
10. The **vacuum hose** connected with the fan or vacuum channel ensures constant vacuum. This is shown on a manometer, which is easily visible from the cab.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OPTIMUM PLACEMENT FOR PREPARED AND LIGHTER SOIL
CONVENTIONAL SOWING

The sowing units - like the whole machine - are modular in design. The basic element always remains the same and the equipment can vary according to individual requirements.

2 sowing units for conventional tillage.

The **Standard row** is used in conventionally prepared soil conditions. Soil is not too heavy and the land is always ploughed. The parallelogram, sowing coulter with coverer and press wheel ensure good penetration and prevent blockages.

The Tandem row is the right solution for light and marshy soil. The front wheel is connected to the press wheel with a bar. The depth of the row is guided by the front and rear wheel and can be centrally adjusted by a handle in the back.

Both row versions are available with either 30 or 55l seed hopper.

Standard

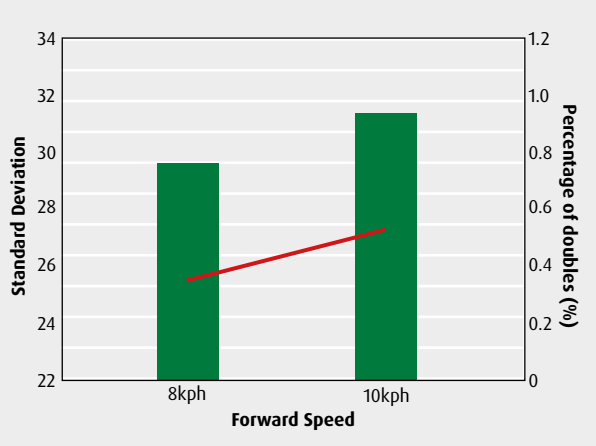
Tandem

PERFECT SEED PLACEMENT WITH HD-II ROW
MULCH AND CONVENTIONAL SOWING

The HD-II row is the universal sowing unit for all conditions from light to heavy soil or in conventional or mulch conditions. Safe operation despite plant residues.

Up to 100kg additional pressure.

- **Optimal depth control** even under extreme conditions, due to the heavy basic weight of the sowing unit with the possibility to add additional pressure (up to 100kg) onto each individual sowing unit via the spring-loaded system.
- **Effective ground contour following**, due to the large lateral depth control by open gauge wheels (ø 410mm, width 120mm).
- **Precise seed placement** by the small coulter which forms a clean furrow. Light re-compaction and seed covering is done by the intermediate press wheel (as option: heavy stainless steel) and the multi-adjustable V-press wheel - to ensure maximum field emergence.



Consistency of spacing
At both speeds Optima placed the seeds within an accurate range.

Based on source: Top Agrar

- **Pressure adjustment of the sowing unit by lever**
- **Easy depth adjustment by spinning the gauge wheel up/down**
- **Cast-iron intermediate press wheel with self-cleaning rubber wheel**
- **Adjustable angle and pressure of the V-press wheel**

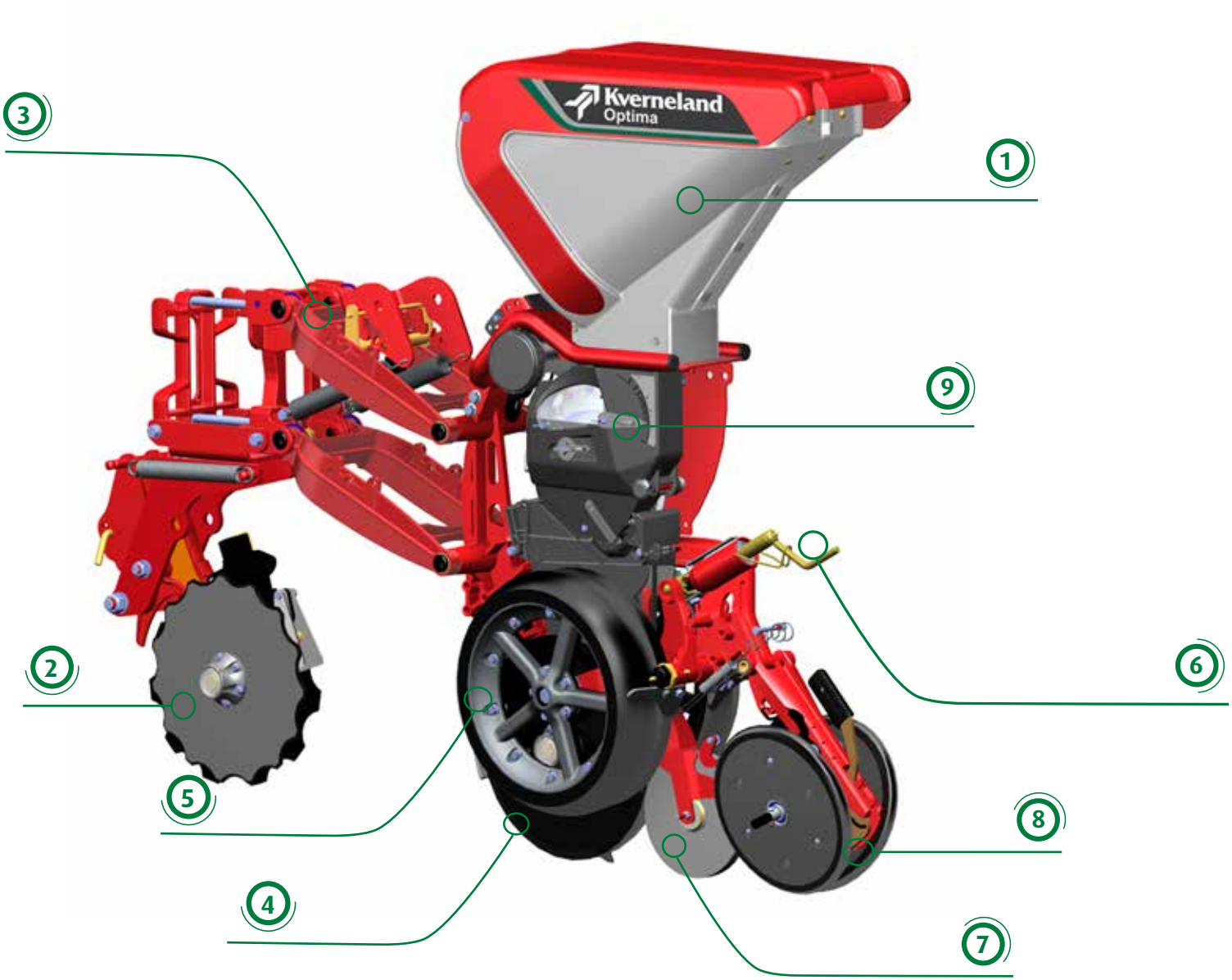
For even more precision, connect implement with an ISOBUS terminal.

SOWING ROW HD-II
FOR LIGHT AND HEAVY SOIL

The stable patented cast-iron HD-II single Monoarm gives direct and easy access to the seeding heart with strong pivoting points.

Versatility and reliability are key.

1. 55l (30l) seed hopper
2. Notched double disc fertiliser coulter for all soil conditions
3. 410mm (273mm) parallelogram with additional 100kg (mechanical) weight transfer as standard
4. Double disc coulter with exclusive bearings and patented sealing
5. Open gauge wheel with oscillating connection for smooth depth guidance
6. Spindle for convenient and precise depth adjustment
7. Optional stainless steel intermediate press wheel or cast iron with rubber ring for best seed-to-soil contact
8. 25mm (50mm) V-press wheels with pressure and angle adjustment for a safe closing of the furrow
9. Optima seeding heart - precise and well-established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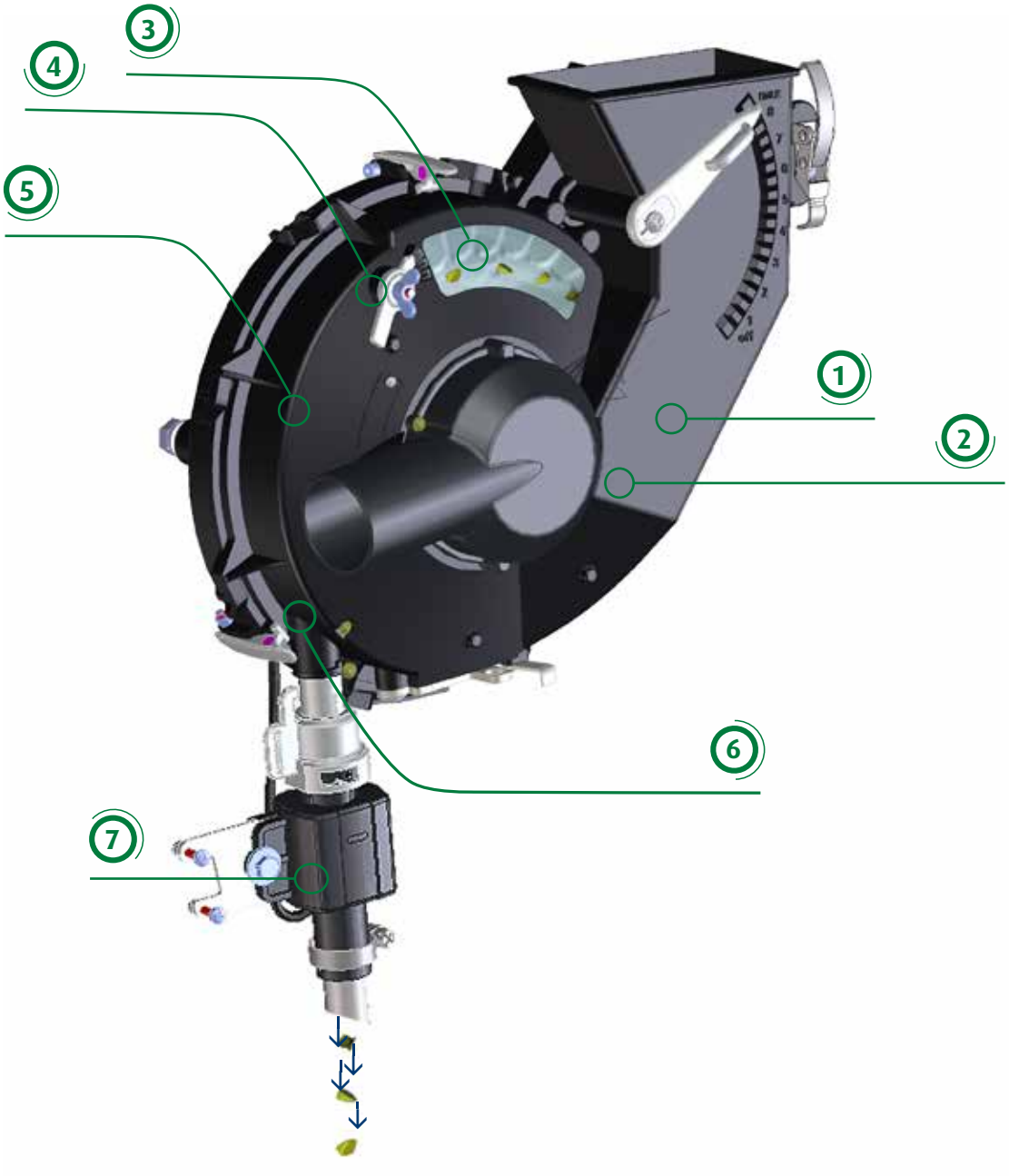
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THE SX SEEDING HEART
PRECISION AT HIGH SPEED

With the pressurised seeding heart the seeds are "shot" by an airstream of up to 70kph into the furrow. A smooth, flexible intermediate press wheel catches the delicate seeds. Any negative impact such as vibration on the way between release point and soil contact is eliminated due to the high air stream. The seeds reach their perfect position in the soil. Each sowing row is electrically powered by ISOBUS connection. An additional generator or other power sources are not required. The complete power supply and control is via ISOBUS.

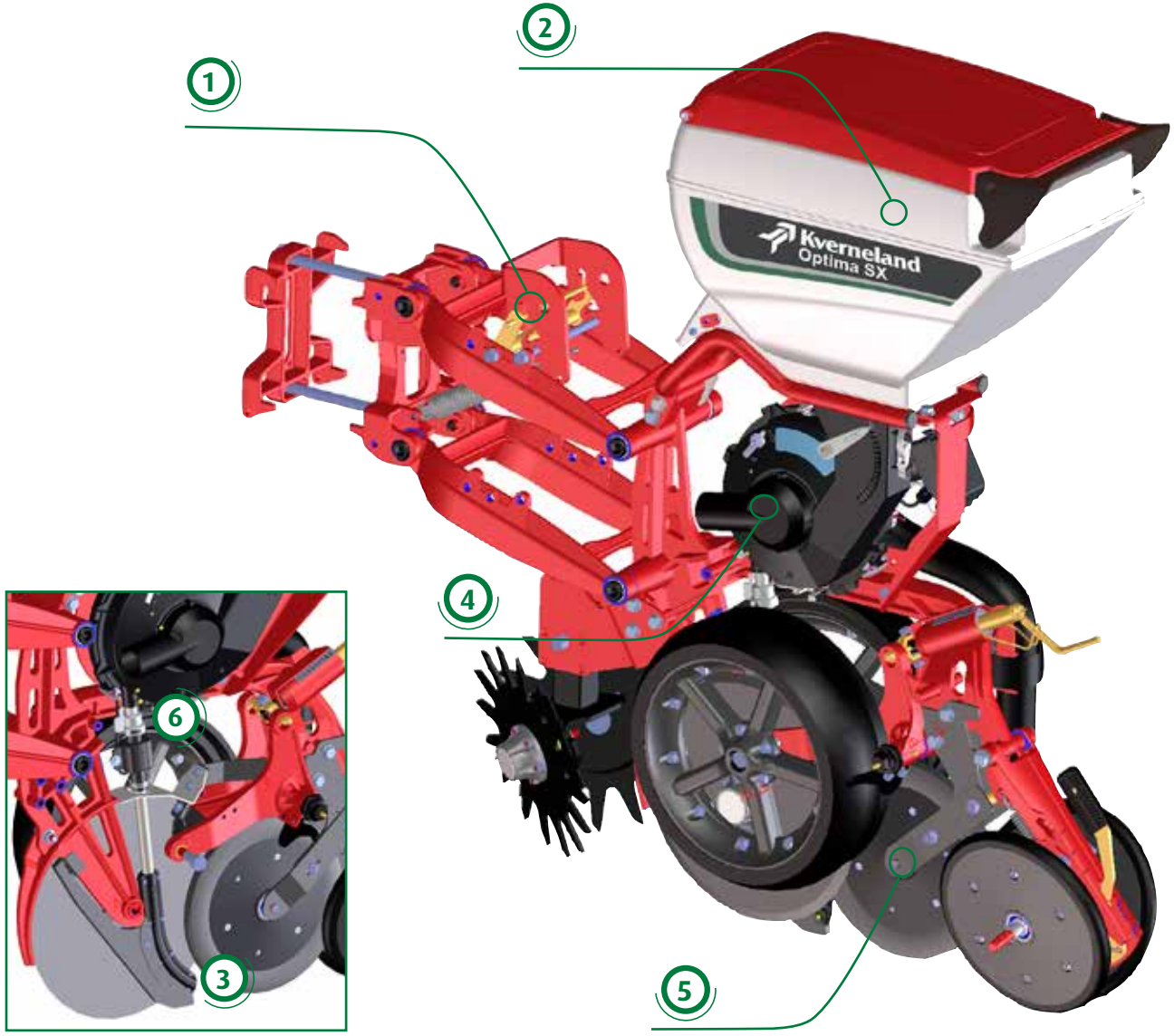
1. By using **air pressure**, the seeds are taken directly to the seed disc. Whilst turning the seed disc, the seeds are allocated to each of the holes.
2. The **filling height limiter** regulates the stream of the seeds, especially of small seeds.
3. The adjustable **upper toothed scraper** singulates the seeds to every hole.
4. The adjustable **lower scraper** ensures that bigger seeds are turned in the correct position and same direction.
5. The **seed disc** rotates to the point of release. The seed disc is directly fixed to the turning back - closed only by a bearing. The seeding heart is without sealing for minimised friction, wear and power requirement.
6. At the point of release, the seed drops down, controlled by the seed disc into the **seed tube** supported by the high air stream.
7. An **infrared photo sensor** monitors the perfect allocation of the seed disc. Defects or doubles as well as low level alerts of the seed hopper and seed counter are reported to the terminal.

HIGH SPEED SOWING UNIT
UP TO 18KM/H FOR UTMOST EFFICIENCY

The Optima SX high speed sowing unit ensures maximised performance and efficiency. With accurate seed singulation, precise seed placement and higher working speeds of up to 18km/h, the Optima TFprofi seeder is up to 100% more efficient than the HD-II row. The sowing row can be combined with the Optima TFprofi, the multi-flexible telescopic Optima V and large rigid Optima RS frames. All components are ready for high speeds.

- **Optimum depth control** due to the heavy basic weight of the sowing unit with the possibility to add additional pressure (up to 100kg) onto each individual sowing unit via spring-loaded system or optional hydraulically.
- **Effective ground contour following** due to the large depth control by open gauge wheels (∅410mm, with 120mm)
- **Precise seed placement** by the small coulter which forms a clean furrow. Good placement and seed covering is done by the smooth flexible intermediate press wheel and multi-adjustable V-press wheel.

1. All basic components of the row (cast-iron Monoarm, parallelogram, double disc coulter, open gauge wheels, trash wheels, V-press wheels etc.) are taken form the well-known HD-II seeding row.
2. 60 litres seed hopper capacity.
3. High speed seed tube.
4. Pressurised Optima SX seeding heart. Without seals - no friction, no wear. Integrated electric motor with GEOSEED® function.
5. Smooth flexible intermediate press wheel for catching the seed to ensure good seed placement and recompaction.
6. Infrared monitoring of singulation quality.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OPTIMA TFmaxi
FOR MAXIMUM OUTPUT

Precise seed placement and high efficiency - that is Optima TFmaxi. Folding is activated easily from the tractor cab. Also all other functions are integrated in the ISOBUS steering system: electrohydraulic drive of the fertiliser applicator or the e-drive of the row units. In combination with GEOCONTROL® the Optima TFmaxi is not only highly efficient - it's also very precise.

The Optima TFmaxi combines high performance technology with maximum user friendliness. The machine's clear and logical layout coupled with the high level of intelligent technology offer the user maximum ease of use, from set-up and filling, folding in less than 1 minute and to the seeding operation. The telescopic drawbar frame allows seamless coverage of the field due to the overall length of the machine being reduced to allow tighter headlands turns.

The high performance Optima TFmaxi is equipped with a 4000l fertiliser hopper and 16 seed hoppers - 55l each. An optional central seed hopper of 1000l extends the capacity immensely. Despite the large capacity the pulling force is still low - starting from 240hp.

Up to 100ha per day

Optima TFmaxi	
Working width (m)	12
Number of rows	16
Row width (cm)	70/75/80
HD-II row	●
SX row	-
e-drive GEOCONTROL®	●
e-drive II / GEOSEED®	-
Fertiliser	4000 l
Microgranule applicator	on demand


4,000 LITRES
UP TO 100HA/DAY
12 M WORKING WIDTH
16 ROWS

OPTIMA RS
HIGH PERFORMANCE AND OUTPUT

The Optima RS frame is designed for farmers and contractors looking for a solid and easy solution, but high efficiency.

The Optima RS frame is available in working width from 6.1m to 9.3m. In order to offer maximum flexibility, the Optima RS frame can be adjusted to different row widths, starting from 35cm to 80cm in even and uneven configurations. It can be equipped with the full range of Kverneland sowing units: Optima HD-II, the Optima SX high speed sowing unit, the standard or the tandem sowing unit. The solid and strong frame made by an 180mmx 180mm square tube is ready to carry up to 18 HD-II or SX sowing units.

Compact on the street and wide in the field.

The Optima RS frame can be fitted with a large 2000l fertiliser hopper or alternatively with DF1/DF2 front hopper for a good weight distribution. In addition, the electric driven micro-granule applicator is available for up to 18 rows.

For safe road transport, a strong lengthwise transport device is available – the machine complies with the new EU Type approval and is ready for transport at 40 km/h even with 18 rows and fertiliser, thanks to the pneumatic brake system.

Optima RS					
Working width (m)	6.1	6.8	7.6	8.3	9.3
Number of rows	8-12	8-16	12-16	12-18	12-18
Row width (cm)	45-80	35-80	65	45-70	50-80
HD-II row	●	●	●	●	●
SX row	●	●	●	●	●
Standard/Tandem row	●	●	●	●	●
e-drive / GEOCONTROL®	●	●	●	●	●
Mechanical drive	●	●	●	●	●
Mounted fertilizer 2000l	●	●	●	●	●
Fertiliser in combination with DF1 / DF2	●	●	●	●	●
Microgranule applicator	●	●	●	●	●

OPTIMA TFprofi
MAXIMUM OUTPUT

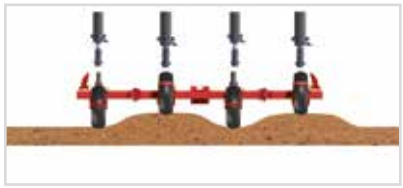
The Optima TFprofi is the perfect combination of high performance and low tractor power requirement. The trailed, foldable frame with eight rows can be equipped with a 2000l fertiliser hopper.

The Optima TFprofi can be operated by a 90hp tractor - requiring no lifting capacity. Equipped with either a hydraulic drive or with a direct fan drive via PTO shaft, this machine can also be used with tractors that have little hydraulic power.

Smooth running.

The Optima TFprofi can be equipped with 4 landwheels to ensure smooth running. Due to an intelligent adjustment system at the wheels, the sowing units perfectly follow the ground contour. The hydraulic cylinders of the landwheels are divided into two parts: one responsible for the lifting process and the other one for the following of the ground contours.

Optima TFprofi	
Working width (m)	6
Number of rows	8
Row width (cm)	70/75/80
HD-II row	●
SX row	●
Standard/Tandem row	-
e-drive II / GEOSEED®	●
Mechanical drive	●
Central seed hopper SX (l)	870
Mounted fertiliser hopper (l)	2000
Microgranule applicator	●




2,000 LITRES
Reduced set-up time due to large capacity of fertiliser hopper.
≥90HP
Low pulling force, no lifting capacity needed
8 ROWS
Each seed hopper has a capacity of 55 litres
90°
Optimised pivoting point for close headland turning
40KM/H
Homologation for road transport

OPTIMA TFprofi SX
WITH CENTRAL SEED HOPPER

Kverneland offers, as an alternativ to single seed hopper, a central seed hopper for the trailed Optima TFprofi, equipped with SX high-speed rows. Due to changing weather conditions, the time slots for sowing maize are becoming shorter and shorter therefore it is necessary not only to increase work rates but also to minimise set-up times.

The pressurised hopper has a capacity of 870 litres, which is 390 litres more than 8 individual SX rows of 60 litres in the standard version. In addition to the increased volume, filling is made easier, especially with BIGBAGS.

870 litres hopper capacity.

The supply chain from the central hopper to the sowing units runs free of electronics and mechanical moving parts. There is one injector per row at the bottom of the pressurised hopper which is supplied by air from the standard fan. The seeds are taken by the airstream and float to the filling area right above the sowing heart of each row where there is a small buffer with about 1.5l volume. If the buffer is filled up to the maximum, the airflow is interrupted and the floating transport of the seed stops immediately. As soon as the seed level in the buffer is declining, air flows again and the seed transport continues.





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- Compact and clear design
- Central fertiliser hopper with filling auger (option for 8 rows)
- GEOSEED®
- Hydraulic frame ballasting kit
- Optional hydraulic fan drive
- Close row sowing

OPTIMA 6M HYDRAULIC FOLDING
PERFECT ON ALL FIELD SIZES

The Optima 6m hydraulic folding frame is the perfect combination of fast folding, high performance and easy handling, also on small field sizes.

The frame can be equipped with 8 rows for maize, 12 rows for the combined usage in sugar beet, maize, sunflowers or soya or with maximum 16 rows for narrow seeding of maize and rape seed.

The mounted fertiliser spreader is the easiest way for fertiliser application. Higher performance is secured in combination with either a front hopper or a FlexCart. Also, a microgranule applicator for a majority of the frames is available. With an electronic or mechanic drive, this frame secures all farmers' needs. GEOSEED® is also available.

Optima 6m PH			
Working width (m)	6	6	6
Number of rows	8	12	16
Row width (cm)	70/75/80	45/50	37.5
HD-II row	●	●	●
SX row	-	-	-
Standard row	●	●	●
Tandem row	●	●	●
e-drive II / GEOSEED®	●	●	●
Mechanical drive	●	●	-
Mounted fertiliser	●	-	-
DF1 / DF2 / FlexCart	●	●	●
iXtra LiFe	●	●	●
Microgranule applicator	●	●	●

- **Compact and clear design**
- **Variable row width**
- **Integrated fertiliser system**
- **Optimised centre of gravity**

OPTIMA V

MAXIMUM FLEXIBILITY

The Optima V is the perfect seed drill for farmers and contractors who need a machine with various row widths. The adjustment of the row width is done in next to no time which ensures a speedy response to changing requirements.

The headstock is made of round tubes which saves weight and increases the stiffness. Plastic glide parts integrated within the main telescopic frame (160mm square tube) guarantee longterm usage of the machine. All inner rows are mounted on 8 maintenance free plastic rolls and are adjustable in different step widths.

- The Optima V is available with 6, 6+1 or 8 rows.
- The Optima V with 6 rows allows the flexible adjustment of the row width e.g. for the sowing of sugarbeet at 45cm or for maize at 75/80cm.
- The Optima V with 6+1 rows offers the additional option to work with either 6 or 7 rows at various row widths.
- The Optima V with 8 rows is ready for close row sowing for high yields.

Ready for GEOSEED®.

Optima V			
Working width (m)	2.70 - 4.80	3.15 - 4.80	2.64 - 4.40
Number of rows	6	6 + 1	8
Row width (cm)	45-80	(6r) 75+80 (7r) 45-65	33-55
HD-II row	●	●	●
SX row	●	●	●
Standard row	-	-	-
Tandem row	-	-	-
e-drive II / GEOSEED®	●	●	●
Mounted fertiliser	●	●	●
Filling auger	●*	-	-
DF1 / DF2	●	-	●
iXtra LiFe	●	●	●
Microgranule applicator	●	●	●

Number of rows	Row width with different settings									
	Type	Rows	1	2	3	4	5	6	7	Transport
	6	6	80cm	75cm	70cm	65cm	60cm	55cm	50cm	45cm
	6+1	6	80cm	75cm						
	6+1	7			65cm	60cm	55cm	50cm	45cm	
	8	8	55cm	50cm	45cm	40cm	37.5cm	35cm		33cm

OPTIMA RIGID FRAME

LIGHT MACHINE FOR VERSATILE CONDITIONS

The rigid Optima frames are a light and costwise excellent alternative for different field sizes.

The rigid Optima with row widths from narrow 30cm up to wide 80cm, depending on the type of row and equipment.

All rigid Optima frames are available with either mechanic or electric drive – also normal seeding, tandem and HD-II rows are available and can be choosen according to field requirements. The Optima can be combined with an optional fertiliser spreader, front hopper or microgranule applicator.

Simple and cost-efficient.

Optima rigid		
Working width (m)	3	4.5
Number of rows	4-8	6-10
HD-II row	●	●
SX row	-	-
Standard row	●	●
Tandem row	●	●
e-drive II / GEOSEED®	●	●
Mechanical drive	●	●
Mounted Fertiliser	●	●
DF1 /DF2	●	●
Microgranule applicator	●	●


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- Precise fertilization and sowing saves costs for fertilizers and seeds
- Environment protection in terms of resources and CO^2-emissions
- Fertilization and sowing in just one pass
- All from one hand!
  One concept - front tank, electronics and seeding technology
- Good ballasting and utilization

IXTRA LIFE FRONT TANK
IN FRONT OF A GOOD START

This innovative ISOBUS combination ensures that seeds are sown at the right place and applies the correct amount of liquid fertiliser at the same time. For the best start of the crop, the liquid fertiliser is placed close to the seed.

The iXtra LiFe front tank works in combination with the precision drill Optima to apply the fertiliser during seeding sugar beet, maize or sunflowers for example. The smart electronics on both seeder and front tank communicate so the application starts and stops together with each individual seed row. The iXtra LiFe provides liquid fertiliser close to the rows of the precision drill. With stricter fertilisation legislation an efficient nutrient application is key to reduce the total amount of fertiliser every year. Row fertilisation is a way to increase efficiency and save money due to a better placement of the fertiliser near the seeds. At the same time it creates space for additional application of organic fertilisers.

The electric driven seeding elements in combination with GPS and GEOCONTROL® automatically switch on or off in exactly the right place, ensuring that there is no overlap in the headland or in any row that has already been seeded. This is especially the case in triangular shaped fields and on curved or irregular shaped headlands.

The liquid fertiliser always follows the row unit which ensures perfect application and prevents double or missing spots.

Kverneland iXtra LiFe	
Sections	4 - 6 - 8 - 12 - 16 - 18
Nominal tank capacity (l)	1,100
Maximum tank capacity (l)	1,300
Clean water tank capacity (l)	2 x 65
Empty weight (kg)	221
Front linkage	Cat. II
Piston membrane pump (hydraulic driven) (l/min)	200
Electrical level indicator Standard	Standard
Control panel	Electrical (ISOBUS)

FRONT HOPPERS DF1 AND DF2
MAXIMUM FLEXIBILITY AND BALANCE

The modular structure of the Kverneland DF1 and DF2 ensures even weight distribution across the machine arrangement, giving the tractor maximum balance. This improves both safety and manoeuvrability, whilst at the same time giving the driver an unrestricted view over the entire machine set-up.

The front hoppers Kverneland DF1 and DF2 are more flexible than a conventional precision drill. The front hoppers are fitted with special metering devices and the appropriate distribution head for row fertilising.

DF1

The standard hopper capacity of the DF1 for seeds or fertiliser is 1,150 litres. This can be increased to 1,700 litres with an optional hopper extension. The hopper can be filled using Big Bags, a front loader or an auger. An easily accessible, foldable platform at the hopper is available as an option to allow manual filling if required. Alternatively, the hopper can also be combined with a wheel packer for reduced front axle loading in work. The Kverneland DF1 is fitted with one mechanical metering device as standard or optional with the electric driven ELDOS. Both versions are allocated under the hopper which is easily accessible from the front. A large emptying chute directly above the metering device allows quick removal of leftover seed. A hydraulic fan drive can be supplied for tractors without a front p.t.o. shaft. The minimum power requirement for the Kverneland DF1 is 80 kW.

DF2

The bigger version of the Kverneland DF1 the DF2 with front twin hopper has two metering devices. These are driven via the spiked landwheel, which runs on the right side of the machine. Hydraulic fan drives and landwheel lifting are available as options. The hopper of the Kverneland DF2 holds up to 1,650 litres of seeds or fertiliser. This can be increased with an extension up to 2,200 litres. Used in combination with a precision drill, the hopper can feed up to 16 rows with fertiliser. The minimum power requirement for the Kverneland DF2 is around 130 kW, and with the electronic metering device ESA, the Kverneland DF2 is also GPS-compatible.


CLAAS
AXION

OPTIMA E-DRIVE II
CONTROLLING AND STEERING FROM CAB

e-drive II	
Individual row start and stop function	●
Variable seed rate per row	●
Variable seed rate adjustment during sowing	●
Two independent tramlining systems	●
Opto-electronic control	●
Section control	●
Application maps	●

With e-drive II each sowing unit is driven individually via an electric motor. All the data is entered and read by an ISOBUS conform terminal like IsoMatch Tellus PRO or Tellus GO+. The sowing distances are infinitely adjustable on the move. All the sowing units can be switched off individually. This solution saves seeds and money!

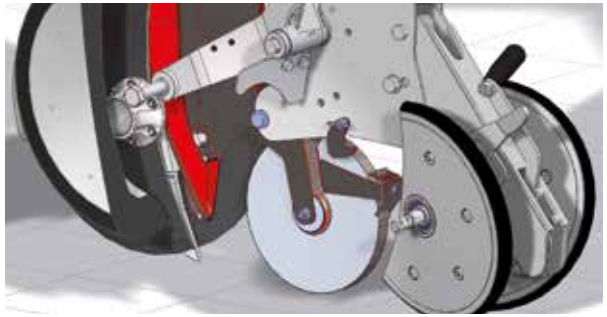
ISOBUS Standard.

In conjunction with close row sowing widths of 37.5cm or 45/50cm another benefit of e-drive II comes into play: Individual tramline control. Tramlines can be set up for every sprayer width and irrigation system.

The e-drive II features complete electronic monitoring of all machine functions. This includes the seed monitoring by opto-electronic sensors as well as the steering of hydraulic functions such as the control of trackmarker arms and folding processes. Only the design of the seeding heart without a sealing enables the steering of all these functions without external power supply. All functions for every machine can be used without an extra generator or accumulator.

Rape Kit

Sowing rape with your precision drill enhances the range of application and improves the pay back of the machine costs. Results from various testing facilities have shown a high germination rate of precision-drilled rape, especially in difficult soil conditions. Thus each rape plant has best access to nutrients and water for high yields.



Channel Extra

The Channel Extra is for shallow sowing of small seeds like sugarbeet and rape seed. Perfect placement is guaranteed by the special design of this falling channel. Curling or jumping of seeds in the seed furrow is prevented.

Intermediate Press wheel

Kverneland's intermediate press wheels provide the best seed-to-soil contact. This is especially necessary in dry conditions to get best access to capillary water. This is the most available form of water for plants to utilise because it is in the soil pore spaces or held loosely around soil particles. The cast iron version with rubber ring is designed for light to mid soil with less stones. The heavier stainless steel roller with scraper is used in heavy stony field conditions.

Equip your Optima according to your requirements.

Operator-friendly

- Excellent overview
- Electronic monitoring of all functions
- Complete control of the machine from cab

Environmentally friendly

- Precise and defined application with GEOCONTROL® and GEOSEED®
- Saving seeds and fertiliser

Return on investment

- Saving costs of seeds and fertiliser
- Increase in yield

State-of-the-art technology for the professional farmer.


Kverneland

- **Perfect crop establishment systems**
- **For mulch or conventional sowing**
- **For all cultures from beans to rape**

OPERATOR-FRIENDLYNESS
SIMPLE ADAPTATION AND ADJUSTMENT

Trash Wheel
Seeding in different conditions extends the usage of your Optima. For conditions with a high amount of residues, the Optima can be equipped with trash wheels that remove straw and other residues in front of the sowing unit.

Pressure Adjustment
With the additional pressure adjustment either mechanically from 0 - 100kg or hydraulically up to 125kg the operator can individually adjust the coulter pressure of each row to any soil conditions: 0kg in light and sandy soils, 100kg resp. 125kg in heavy clay. This ensures smooth running and an uniform sowing depth.

Double Disc Fertiliser Coulter
The notches of the double disc fertiliser coulter give perfect traction in all soil conditions and allow perfect fertiliser placement. The overload protection ensures blockage-free operation especially in conditions with stones or with high amounts of residues. The integrated scrapers are useful for sticky soil.

ELECTRIC MICRO GRANULE APPLICATOR
MICRO-DRILL FOR OPTIMA HD-II AND SX

The demand for microgranule applicators is increasing. Micro nutrient and also small amounts of insecticides or fungicides ensure the best start for the crop.

The electric driven micro granule applicator micro-drill for the Optima HD-II and SX sowing units has been designed as backpack behind the sowing unit and offers a hopper capacity of 17 liters. It is electrically driven and ISOBUS controlled. The metering device consists of a wear-resistant plastic housing and exchangeable cell wheels made of stainless steel which ensure precise metering of the micro granules.

Operator saftety
Increasing operator safety by easy and safe handling was focus during development. Therefore, the operator can exchange the cell wheels even when the hoppers are full of granule. There is no need to empty them first, reducing the operator's risk of being in direct contact with the granules.

A plus for the environment
The granulate falls freely into the seed furrow without air support, minimising the emission of dust and complying with the current guidelines for emission control for any granulates applied.

Precision Farming
The comfortable, fully ISOBUS integrated control system allows the adaption of the stop and start points of the seed row. This ensures precise shutting on and off at the end of the field (without overlaps or faults) and in addition allows the switching off during tramline operation.

Optima SX

Optima HD-II

Kverneland Micro granule applicator micro-drill	
Hopper capacity (Liter)	17
Minimum application rate (kg/ha)	2 (37.5 cm row width & 2km/h)
Maximum application rate (kg/ha)	25 (80 cm row width & 18km/h)
Cell wheels	Different cell wheels in 3mm, 6mm and 9mm width for Granule, Micro fertilizer and slug pellets
Power requirement	max. 3 A / 12 V
Electronic system	ISOBUS (GEOCONTROL of the sowing row)
Electronic standard	AEF conform
Weight (without granule/ferilizer) (kg)	8.9
Optima Models	frames with HD-II e-drive II and SX rows

1

2

3

3

4

4

5

6

7

MICRO-DRILL OPTIMISED CROP CARE
WITH ELECTRIC DRIVE

Each micro granule applicator unit micro-drill is electrically powered by ISOBUS connection. An additional generator or other power sources are not required. The complete power supply and control is via ISOBUS. A calibration test is necessary to adjust the system to according granules or fertiliser. The system defines the correct cell wheel and setting quantity.

1. The **hopper** has a capactiy of 17 liter. Comfortable is the low filling height. The filling level is visible from outside. The tank empties completely without any additional cleaning. The easy backwards slided hopper cover is prepared for using a sure-fill adpater.

2. The **electric driven metering device** regulates the dosing process for different granules. The metering device developed in Kvernelands own plastic factory in Germany consists of a wear-resistant plastic housing. A motor drives the system via two gear wheels. The motor speed depends on the granulate volume and is steered by the ISOBUS system.

3. The integrated **shut-off valve** enables a cell wheel change even if the hopper is full of granules or fertilizer.

4. With the **adjustbale lever** it is very easy to convert the system from calibration to work modus.

5. Different **cell wheels** with large and small cell depths are made of stainless steel and suitable for different granules and applications rates. Three exchangable cell wheels are ready to hand and stored well-protected in a box at the unit.

6. The operational cell wheel is fixed in a **cartridge.** Therefore will be no touch-contact with the granulate when exchanging the cell wheel.

7. A well arranged sticker with a **scale** indicates the correct cell wheel at the cartridge.

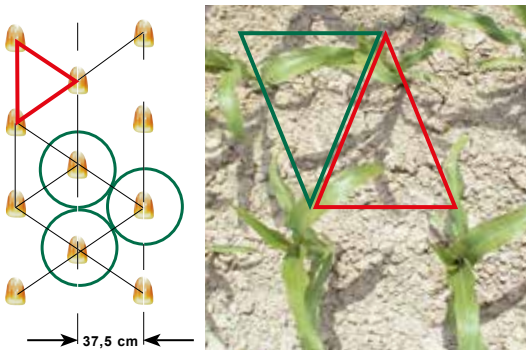
CLOSE ROW SOWING
OPTIMUM CONDITIONS FOR GROWTH

Giving all plants the optimum growing conditions and same access to nutrients, water and sun is the basis for high yields.

With the sowing of maize, former harvesting processes had limited the standard row distance to 75cm. Due to the introduction of chopping and picking attachments which are independent of this former standard row width, close row sowing has become possible.

This opened up for enhanced growth. Various tests have shown that with row distances between 30cm to 50cm yield increases by up to 10%. In fact, close row sowing at 37.5cm has turned out as the optimum setting for prosperous maize population.

Up to 10% higher yields.



Close row spacing and defined seed placement by GEOSEED® ensures optimum growth

- **From 37.5 to 50cm**
- **2-D Placement with GEOSEED®**
- **Optimum growing space**
- **Yield increase up to 10%**

GEOCONTROL®

COST SAVING WITH PAYBACK

The more precisely and evenly a seed is sown, the easier it is to work and harvest, and the greater the possible yield.

Seeding with GPS and GEOCONTROL® in combination with an Optima e-drive II is a major step towards precision and cost saving. These machines are all equipped with ISOBUS technology which, with the help of the IsoMatch Tellus PRO terminal, can be easily controlled.

Each electric driven seeding element, in combination with GPS and GEOCONTROL®, is automatically switched on or off in exactly the right place, ensuring there is no overlap with any row that has already been sown. This is especially handy in triangular fields, on curved or irregular shaped headlands. You can also continue seeding at night since the switching on/off of the seed elements is completely reliable.

iM CALCULATOR APP - free to download

After filling in the required data, the calculator clearly shows what you can save in terms of money. With GPS it is possible to accurately seed, spread and spray without any overlap. The iM Calculator app calculates the cost saving by using those GPS functionalities.

The amount of seeds saved depends on the size and shape of the field and may amount to more than 5%.
The iM Calculator app for tablets is free to download from the App Store or Google Play.
Please find the online calculator on our homepage:
http://imcalculator.kvernelandgroup.com/#/

GEOSEED®

PATENTED 2-D SEED PLACEMENT

GEOSEED® increases the yields of row crops and ensures maximum efficiency. Seeds are placed perfectly in line and in relation to each other.

GEOSEED® Level 1 is the synchronisation within the working width. This improves the distribution of seeds up to perfection in parallel or diamond pattern: Positive effects are the best use of nutrients, water and sun. Also the wind and water erosion is decreased. **GEOSEED® Level 2** is the synchronisation over the whole field. This is the necessary requirement for interrow cultivation, also across the seeding direction. GEOSEED® is the only system in the world, that makes this mechanical weed control possible!

Biologically working farmers are also able to use a mechanic weed control across the seeding direction without injuring the plant. This saves costs and increases the turnover. With an exactness of 2.5cm yields are increased. With RTK GPS signal the synchronisation of rows can be done over the whole field of sugarbeet or maize, pumpkins or beans.

- **Increase in yield**
- **Best use of nutrients, water and sun**
- **Reduces the risk of water and wind erosion in hilly conditions**
- **Allows interrow weed control**

MANAGE YOUR FARM AS A BUSINESS
WITH OUR ISOMATCH PRECISION FARMING OFFERING

Our precision farming offering is essential in managing your farming business with success. Applying electronics, software, satellite-technology, online tools and Big Data enables you to use your farming equipment more effectively and reach higher profitability of your crops.

iM FARMING - smart, efficient, easy farming

Speed up on the path towards connected agriculture. We offer you numerous options and solutions for how to produce more with less; utilise inputs more efficiently and thereby increase profits and sustainability.

Enhance your success with e-learning

IsoMatch Simulator is a free downloadable virtual training program. It simulates all functions of the IsoMatch Universal Terminals and Kverneland ISOBUS machines. Train yourself and make yourself familiar with your machine to avoid errors and enhance your machine performance.

The best overview in farm management

IsoMatch FarmCentre is the first of a series of telematics solutions. This fleet management solution is applicable for your ISOBUS machines in combination with an IsoMatch Tellus GO+/PRO. Whether you wish to control your fleet, manage tasks remotely or analyse machine performance data, IsoMatch FarmCentre provides this in an efficient web application, linking implements, tractors, terminals and the cloud in one continuous flow of data and connectivity.

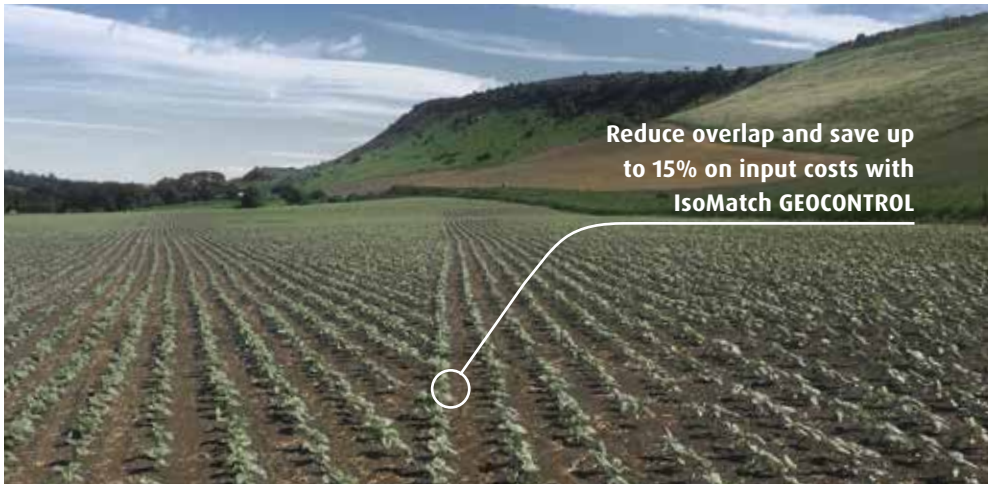
Improve your performance
Maximum efficiency, minimum waste

Be a PRO in increasing productivity

The **IsoMatch Tellus PRO** 12-inch terminal provides you with the optimal solution for an all-in-one control system inside the tractor cab. It is the centre for connecting all ISOBUS machines, running precision farming applications and Farm Management Systems. It offers everything you need to get the maximum out of your machines and crop, as well as cost savings in fertiliser, chemicals and seeds by using automatic section control and variable rate control. With the unique dual screen functionality it gives you the opportunity to view and manage two machines and/or processes simultaneously.

Easy control management

The **IsoMatch Tellus GO+** is a cost-efficient 7-inch terminal, especially developed for managing the machine in a simple way. Easily set up the machine with the soft keys and simply use the hard keys and rotary switch for optimal control while driving.



Maximum savings!
*The **IsoMatch GEOCONTROL** precision farming application includes Manual Guidance and Data Management free of charge. It is possible to expand this application with Section Control and/or Variable Rate Control.*

IsoMatch Grip

This ISOBUS auxiliary device is made for maximum machine control and efficient farming. Operate up to 44 implement functions from one device.

IsoMatch Global 2

GPS antenna enabling satellite navigation for site-specific section control, variable rate application, manual guidance and field registration.

IsoMatch InLine

Light bar for manual guidance including section status information. Manage the distance from the A-B line and steer for the ideal position.

IsoMatch (Multi)Eye

Connect up to 4 cameras to the IsoMatch Universal Terminals. It gives you full control and overview of the entire machine operation.

Flexible in combination

"We are contractors specialized in sowing and precision seeding located in Hoekse Waard, in the South of Rotterdam. For the precision seeding of maize, sweetcorn and pumpkins, we work with a Kverneland Optima 8 and 12 rows in combination with the iXtra LiFe front tank for liquid fertilizer application.
The Kverneland Optima is equipped with the IsoMatch Terminal Tellus Pro which we use also for our other Kverneland seed drills. The front tank and precision drill are both visible and monitored on one screen. Both implements are equipped with GEOCONTROL® which individually shuts on/off the rows, ensures automatic section control on headlands and prevents overlapping in the field.
Thanks to Kverneland technology, we, as contractors provide better use of the minerals in the root zone of the plants. This results in savings both on fertilisers and minerals and is thus environment-friendly. "

Arjan Breure, Contractor Breure Klaaswaal, Netherlands
Main branch: sowing and precision seeding
Optima for precision seeding: pumpkins, maize for silage and sweetcorn

Key to success

"In spring, I use the precision drill for maize sowing and in the summer for the sowing of oilseed rape. This is not only an additional pay-off of machine costs but it meets the often arid conditions we face in our area in the summer. Here it is of major importance to achieve a maximum seed-to-soil contact for an even germination.

Our Optima V is fitted with GEOCONTROL®. Thus we avoid any overlapping or missing of seeds - saving costs on surplus seeds and in addition facilitating any following crop care operations as well as harvesting. Our benefit is the increased yield due to evenly matured crops.

The Optima V offers me an extra in flexibility and with the optimised ISOBUS controlled seed placement, we benefit from a profitable return on investment."

Georg Springorum, Germany
500 ha, Crops: Wheat, Oilseed rape, Barley, Sugar beet, Triticale, Maize
Climate: Continental

ORIGINAL PARTS & SERVICE
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SMARTER FARMING ON THE GO

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First hand access to information on future developments and updates, Operator and spare parts manuals, FAQs and local VIP offers. All info gathered in one place.

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TECHNICAL DATA

Model	Optima rigid		Optima V	Optima 6m PH	Optima TFprofi	Optima RS					Optima TFmaxi
Frame type	rigid		variable	parallel hydr. folding	trailed folding	rigid					trailed folding
Working width (m)	3.00	4.50	2.70 - 4.50	6.00	6.00	6.10	6.80	7.60	8.30	9.30	12.00
No. of HD-II sowing rows	4-8	6-9	6 / 6+1 / 8	8-16	8	8-12	8-16	12	12-18	12-18	12
Row width HD-II row (cm)	37.5-80	45-80	33 - 80 [1]	37.5-80	70 - 80	45-80	35-80	65	45-70	50-80	70-80
No. of Standard / Tandem sowing rows	4-9	6-11	-	8-16	8 (only Standard rows)	8-12	8-16	12	12-18	12-18	-
Row width Standard / Tandem row (cm)	35-80	35-80	-	37.5-80	70-80	45-80	35-80	65	45-70	50-80	-
No. of SX sowing rows	-	-	6 / 8	-	8	8-12	8-12	12	12-18	12-18	-
Row width SX row (cm)	-	-	37.5 - 80	-	70 - 80	45-80	45-80	65	45-70	50-80	-
Central seed hopper (l)	-	-	-	-	○ 870 [5]	-	-	-	-	-	-
Transport width (m)	3.00	4.50	3.00	3.00	3.00 [2]	3.00					3.00
Sowing row											
Mechanical drive of row	○	○	-	○	○	○	○	○	○	○	-
e-drive II, ready for GEOSEED®	○	○	●	○	○	○	○	○	○	○	● [4]
Fan drive 1000rpm	○	○	●	●	●	●	●	●	●	●	●
Fan drive 540rpm	●	●	-	-	-	-	-	-	-	-	-
Hydraulic fan drive	○	○	○	○	○	○	○	○	○	○	○
Hydraulic row lifting device	-	-	○ (6+1)	-	-	-	-	-	-	-	-
Frame											
Linkage	Cat. 2	Cat. 2	Cat. 2	Cat. 2	40mm Ringe eye [3]	Cat. 3	Cat. 3	Cat. 3	Cat. 3	Cat. 3	Cat. 3N Crossshaft
Tyres 7.00-12AS	●	●	-	-	-	○	○	○	○	○	-
Tyres 26x12.00STG	○	○	●	●	-	●	●	●	●	●	-
Tyres 12.5/80-18	-	-	-	-	●	-	-	-	-	-	●
Manually operated track marker	●	-	-	-	-	-	-	-	-	-	-
Hydraulically operated track marker	○	●	●	●	●	●	●	●	●	●	●
Hydraulically frame ballasting kit	○	○	○	○	-	○	○	○	○	○	-
Fertiliser											
Mounted fertiliser spreader	○	○	○	○	○	○	○	○	○	○	○
Maximum no. of rows with mounted fertiliser spreader	8	8	8	8	8	18	18	18	18	18	16
Mechanical drive of fertiliser spreader	●	●	●	●	●	●	●	●	●	●	-
Electro-hydraulic drive of fertiliser spreader	-	-	○	○	○	○	○	○	○	○	●
Fertiliser hopper capacity in litres	440-770	440-770	1000	900	2000	2000	2000	2000	2000	2000	4000
Filling auger	-	-	○	●	○	-	-	-	-	-	○
Weigh cells	-	-	-	-	○	-	-	-	-	-	-
No. of rows with front hopper DF1/DF2/iXtra LiFe	6/8	6/8	6 / 8	8/12/16	-	8 / 12	8 / 12 /16	12	12/16	12/16	-
Micro granule											
Micro granule applicator micro-drill	○	○	○	○	○	○	○	○	○	○	○

Optima row variants	Standard	Tandem	HD-II	SX
Hopper 55l	○	○	●	60
Hopper 30l	●	●	○	-
Up to 100kg weight transfer to the parallelogram mechanically adjustable	-	-	●	●
Up to 125kg weight transfer to the parallelogram hydraulically adjustable	-	-	○	○
Clod deflector	-	○	○	○
Trash wheel	-	-	○	○
V-press wheel 25mm	-	-	●	●
V-press wheel 50mm	-	-	○	○
Farmflex 370mm	●	-	-	-
Farmflex 500mm	○	-	-	-
Monoflex press wheel	-	●	-	-
Gauge wheel 120mm	-	-	○	-
Open gauge wheel	-	-	●	●
Intermediate press wheel stainless steel with scraper	-	-	○	-
Intermediate press wheel cast iron with rubber ring	-	●	○	-
Electric drive	○	○	○	●
Mechanical drive	○	○	○	-
Lifting device	●	●	○	○
Rape kit	○	○	○	○
Channel extra	-	-	○	-
Weight (kg)	60	75	129	129

[1] Depending on no. of rows

[2] 3.40m if 80cm row width

[3] Optional Cat. 3/Cat. 3N cross shaft and K80 pulling eye

[4] Only e-drive without GEOSEED®

[5] Only with SX row version without single seed hopper

● Standard equipment
○ Option
- Not available

WHEN FARMING MEANS BUSINESS

kverneland.com