



CLI/CLG-II/FLATLINER/DTX

SUBSOILERS

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.





TILLAGE

Preparing and cultivating your soil in order to achieve the highest possible yield is about choosing the correct tillage system.

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

| KVERNELAND'S INTELLIGENT FARMING SOLUTION | | | Deep Tillage (not a must) | Basic Tillage | Seedbed Preparation | Seeding | Spreading | Spraying |
|---|-------------------------------------|---|--|---|---|---|--|--|
| CROP ESTABLISHMENT SYSTEMS | CONVENTIONAL | |  |  |  |  |  |  |
| | intensive | | |  |  |  | | |
| CONSERVATION | Soil coverage after Seeding | |  |  |  |  |  |  |
| | 15 - 30% | | |  |  |  | | |
| | Reduced Till without soil inversion | | |  |  |  | | |
| extensive | > 30% | |  |  |  |  |  |  |
| | Strip Tillage stripwise loosening | |  |  |  |  | | |
| Vertical Tillage shallow tillage | |  |  |  |  |  |  | |

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



GROWTH

DURABILITY

EFFICIENCY



SUSTAINABILITY

KEEP UP YOUR ASSETS

Growth

The key to a successful harvest is good preparation. Eliminating compaction in the soil to maximise the roots' uptake of moisture and nutrients is vital, as is the preparation of a fine, level, weatherproof seedbed. Ensure a sound soil structure for your growth.

Efficiency

You want the best equipment for your specific conditions. Kverneland offers a large range of models and accessories to meet your requirements for subsoiling, stubble operations or seedbed preparation.

Durability

You want a machine that lasts, that keeps up with the stress on the material over a long time. Still, you don't want to pay for extra power. With the special design of the tines and frame, the pulling traction has been reduced. Better traction of the tractor means increased strength and longer durability, which leads to savings on fuel and tires.

Harvest starts here.



Why subsoiling?

Overcome compaction for a healthy soil structure.

- **Improved drainage**
- **Optimal root development**
- **Better soil aeration**

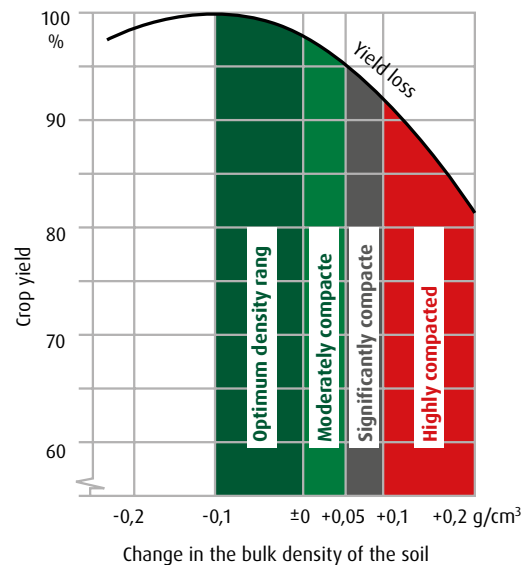
HIGHER YIELDS

STRONG ROOT DEVELOPMENT

Subsoiling for good soil structure, root growth and increased yield stability!
Soil loosening is an essential operation for long-term soil management and maintenance. Healthy soil structure increases yields by up to 30% depending on soil type and crop.

Visible strips showing erratic emergence of the germinating seed are a common problem. Often this is the consequence of over-compacted subsoil at the headland and / or in the tramlines, caused by the use of heavy implements or working on waterlogged soil.

Yield increase up to 30%



Yield loss through soil compaction
Source: Department of the Environment, Conservation and Geology of the Land Mecklenburg-Vorpommern

The roots of the crop cannot penetrate these compacted zones. This leads to an insufficient supply of water and nutrients resulting in significant loss in yield. Sub-soiling breaks up compaction in the subsoil and restores the gaseous exchange capability. Restructuring of the soil profile is particularly beneficial within a conservation tillage system where removing compaction and reducing bulk density is required.

Subsoiling is the first step towards successful seed germination and emergence.

KVERNELAND SOIL KIT MAINTAINING SOIL STRUCTURE

Without checking soil profile to identify potential areas of resistance it is not possible to determine the correct depth of any compaction or barriers. This is important when planning operations to resolve any problems. You may already be aware of soil compaction but not have the tools to confirm the extent of the problem. For example, unnecessarily trying to correct soil compaction by tilling to a deeper depth can be a waste of time and money.

The Kverneland soil kit within a stable case provides the necessary tools to access the soil profile ahead of any cultivation. It includes a Penetrometer which measures the compaction of soil, a knife, folding ruler, brush, shovel and a pair of working gloves. The Kverneland soil brochure included will also provide useful technical information in choosing the correct cultivation practice.

Please ask your local dealer for the Kverneland SOIL KIT to provide you with the correct equipment to improve your soil health, increase yields, save time and reduce fuel costs.





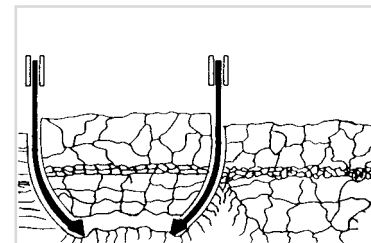
CLI - SHORT MOUNTED SINGLE BEAM SUBSOILER SOLO OR IN COMBINATION

The single-beam subsoiler Kverneland CLI has all the advantages of the curved tine and can be used on its own or in combination with short disc harrows, power harrow and/or seed drill.

An oversized beam of 200x200x10mm is fitted with all the tine supports and front and rear linkages (option). The single-beam concept provides the most robust rational design, allowing an underbeam clearance of 1,175mm, to guarantee operation without blockages, at depths from 15 to 40cm. This substantial clearance allows the combination with other tools and the passing of the power-takeup under the beam.

From 15 to 40cm working depth

The curved tine of the CLI acts by lifting up the soil volume without disrupting the surface. The curved tines exercise vertical and steady pressure while maintaining good vibration capacity to intensify cracking of the soil. Due to the tine profile of the CLI, even in combination with Qualidisc or Qualidisc Farmer a 3.0m version requires only approx. 160hp at 30cm depth, limiting consequently the fuel consumption.







CLG-II CHISEL PLOUGH FOR TOUGH CONDITIONS

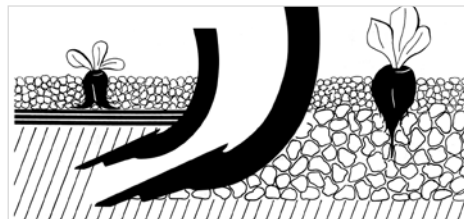
Designed to loosen subsoil and break up wheel tracks, to improve soil structure and promote good drainage. By increasing the soil's permeability, the seedbed conditions are improved for faster and better germination. Better drainage and efficient gaseous exchange lead to an effective nutrient uptake.

The tines (choose from CLC tines or CLG tines) provide good penetration, even in hard and dry conditions and create an intensive crumbling thanks to their unique design using heat-treated hollow tubes. The long tines are able to move up to 20cm sideways.

Efficient penetration

The CLG-II is fitted with the well-known Kverneland auto-reset leaf spring system. The leaf spring protection system is very simple and strong with little or no maintenance. The individual leaf springs allow each leg to ride over any obstacle for a trouble-free operation and return to their original position automatically.

The flexible design offers optimal possibilities to adjust the tine spacing and to increase the implement size. The unique connection clamp bolts the whole construction together. The less welding, the more robust - the flexible "bolt-on" construction.



FLATLINER -MAXIMUM SOIL SHATTER MINIMUM SURFACE DISTURBANCE

The benefits of selective soil loosening should never be underestimated, particularly following a wet autumn. Healthy root growth is essential if crop yields are to remain high. Any sub-surface pans must be identified and then removed. Incorporating the latest technology, the Kverneland Flatliner with the modern V-frame offers the perfect solution.

Down to max. 50cm

The Flatliner provides maximum shatter of deeply embedded compaction layers with minimum surface disturbance across the working width. It works to a depth from 30cm to 50cm. The frame equipped with bolted clamps for tine fixing allows adjustment of the tine spacing. The curved shape of the Pro-lift and LD tines and the high quality chrome-boron steel reduce the wear, limit the power requirement and prevent the rising of clods and stones to the surface.



The Pro-Lift tine available with 3 different widths of wing shares is composed of 5 wearing parts for extend lifetime.



The low disturbance tine LD tine loosens without surface heave and smearing at depth. The soil flow closes directly behind the tine.

'V' Profile toolbar

The 'V' form toolbar is designed to ensure progressive subsoiling with the minimum power requirement, ease of trash passage through the machine, and optimum shatter.

Pro-lift tines

The Pro-Lift tine and point provide a very effective soil conditioning action with prolonged wear rates. The tines can work down to max. 50cm depths.

Low Disturbance tines (LD)

LD (Low Disturbance) tines are available for a minimum minimum disturbance of the surface aggregates. The tip is protected by a carbide piece to extend the life.

MAX. 50CM

Positive control of the working depth.

Max. 87CM

Adjustable tine spacing with clamps.

Ø600MM

DD rings for weather proof reconsolidation and levelling.

3 OR 5 TINES

Lifting the soil and loosening compaction.



- Easy hydraulic depth adjustment via the rear DD roller
- Adjustable Qualidisc Farmer disc section in two positions
- Subsoiling down to 40cm and shallow cultivation 10cm deep

DTX - ONE PASS PREPARATION

VERSATILE AND COST-EFFECTIVE

As a result of growing farms and shorter weather periods, time has become a valuable factor. Therefore, the DTX combines different operations in one pass to save time.

Deep loosening, shallow cultivation

Designed as a mounted one-pass stubble incorporator/soil loosener for tractors in the 200-360hp range.

The DTX is extremely versatile. It can be used for first entry with non-inversion tillage or to knock down ploughing whilst loosening down to 40cm. It is also ideally suited to establish oilseed rape straight into stubble as it leaves a level consolidated weatherproof seedbed. The DTX also offers very good trash clearance. The front tines are staggered and the rear discs allow a full cut and mix from 2 to 10cm deep.

The Kverneland DTX combines the tines (Pro-Lift or LD) with the proven disc section of the Qualidisc Farmer short disc harrow (Ø 520mm). Soil can be loosened with the Pro-Lift tine down to 40cm and with the LD tines up to 25cm deep while the top soil layer up to 10cm is incorporated with the disc sections. The tine and disc section as well as the roller DD600 are connected in a high quality frame which allows for operation even in the heaviest soil conditions. The DTX is equipped with side deflectors which are well-known from the Qualidisc range. This ensures perfect levelling in all types of conditions and true 3m working width.



The Pro-Lift tine as hydraulic auto-reset version available on DTX.

Pro-lift tines

The Pro-Lift tine and point provide a very effective soil conditioning action with prolonged wear rates. The DTX proposes 2 different tine options: shear-bolt or auto-reset version. On models with hydraulic auto-reset, the point pressure can easily be adjusted from 1,700kg to 2,925kg for the hardest soils or stony conditions.

Low disturbance tines (LD)

LD (Low Disturbance) tines reduce surface disturbance without smearing. The soil flow closes directly behind the tine. The tip is protected by carbide to extend the life time.





- Long durability
- Low power requirement
- Improved trash flow
- Deep loosening
- Maintaining the soil structure

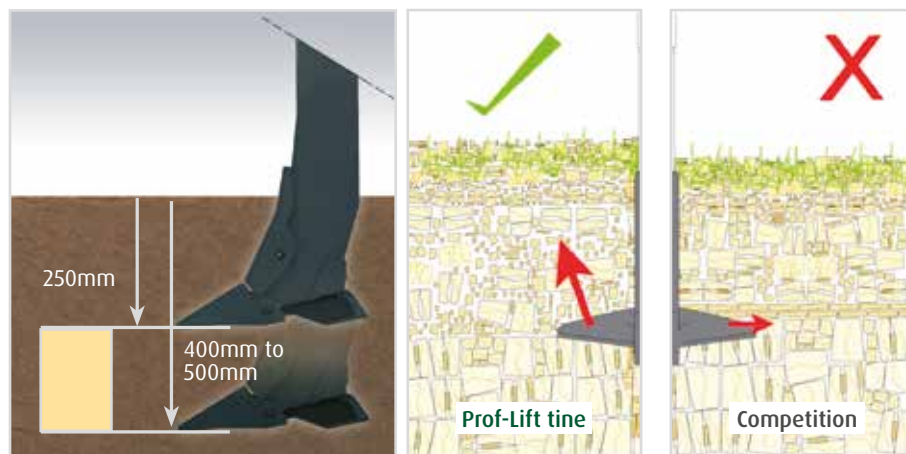
PRO-LIFT TINE - LIFTING AND LOOSENING EXCELLENCE IN HEAVIER SOILS

The Pro-Lift tine lifts and loosens the soil above it, reducing bulk density and compaction, whilst minimising disturbance at the surface.

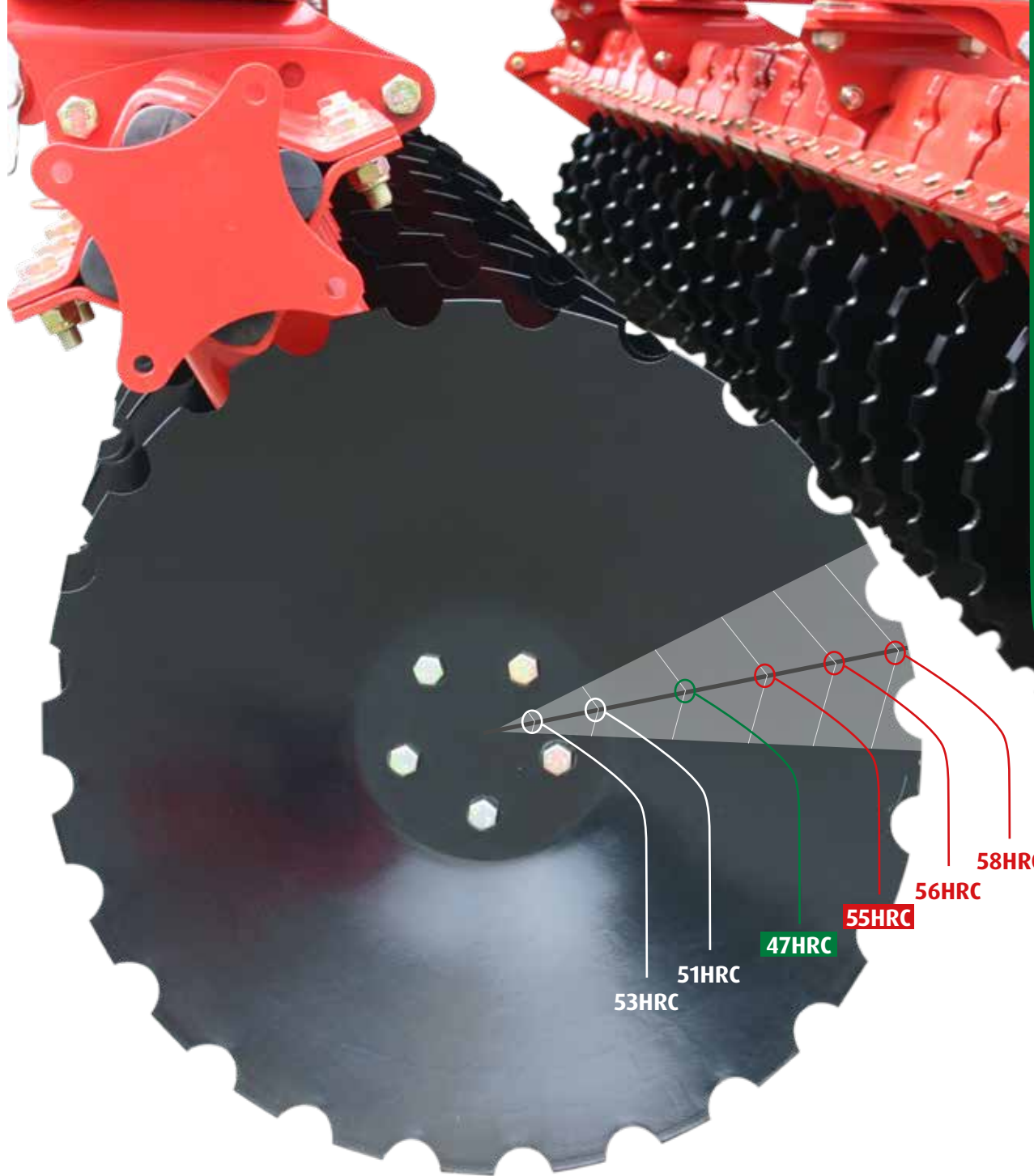
A choice of three different wings - each imparting a different degree of lift - enables the amount of work completed to be matched to the prevailing soil conditions and moisture levels.

Minimal draught.

Lifetime and efficiency of the working components is significantly increased by using five wearing parts. The Pro-Lift tines are protected against overload either by hydraulic auto-reset or shear-bolt safety system depending on model. In addition the tine can be reversed and swapped left to right to increase the operational life (for example behind the tractors wheels).



Soil flow should be UPWARDS (as shown left of centre) rather than outwards or smearing downwards (as shown right of centre). Tines that move the soil SIDEWAYS will not remove compacted layers and may even make them worse.



- Special heat treated disc of 55-58HRC (215 kg/mm²) for long durability
- Long lifetime. A Kverneland disc is one of the hardest disc in the market!
- Softer center for flexibility against obstacles
- Maintains optimum performance throughout wearing lifecycle due to lateral adjustment of the disc unit

DTX: IMPECCABLE CUTTING QUALITY EXCELLENT PENETRATION

The Kverneland DTX offer two rows of discs (Ø 520mm). Each conical disc is heat-treated and mounted with elastic rubber buffers. The high inter-row distance of 900mm ensures optimal soil flow and preparation.

20% longer lifetime than a standard disc.

Conical notched discs

Due to the **conical design** of the disc, the attack angle is always fixed and the cutting angle always stays in the same position. Curved discs transport more soil and improve the mixing effect.

The front row of discs ensure good penetration and primary movement of the soil without blockage. The second row of discs increase soil movement and flow with secondary cultivation and chop of residue.





- **Effective soil to seed/root contact for efficient nutrient transfer.**
- **Minimal moisture loss, especially important in dry years where crops can suffer.**
- **Improved drainage and water infiltration, especially in wet years where a good weatherproof consolidated soil structure ensures access to plant root systems for water, air and nutrients.**
- **Reduced soil erosion, as the soil is both structured and stable.**

DD THE DOUBLE RINGS

THE NEED FOR CONSOLIDATION

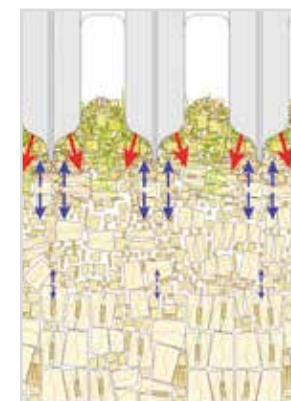
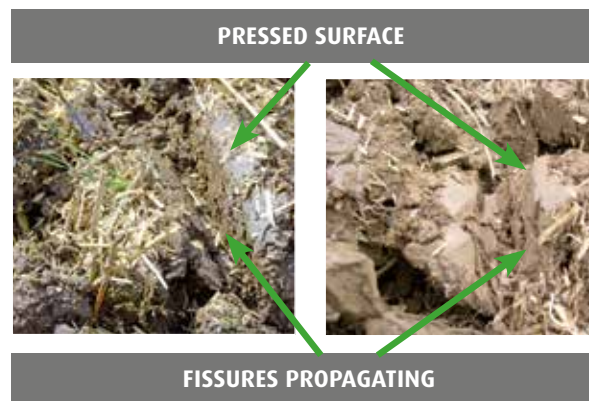


Clods are cut and fissures propagate through a result of the DD action, Broken or cracked clods are left in an ideal state for further weathering

Effective consolidation plays a crucial, but often under-appreciated part in modern arable farming. As part of a reduced tillage or plough based system, it can save valuable time, reduce costs and increase yields. Fundamentally, it plays a key role in combating the problem of compaction, which is a barrier to root growth and water infiltration and a major factor in poor soil structure leading to run-off and erosion.

The well-proven 600mm diameter DD rear roller provides positive depth control and leaves a high quality corrugated, weather-proof surface. Rollers are equipped with heavy-duty scrapers and sealed-for-life 'non-grease' bearings.

Manufactured from the highest quality Chrome Boron steel, the rings have a self-sharpening cutting edge mounted on a broad, carefully angled shoulder. This enables parted halves allowing the fissures to break down, while also contacting over 80% of the soil surface to consolidate and level the seedbed, leaving a ridged, weather-proof surface.





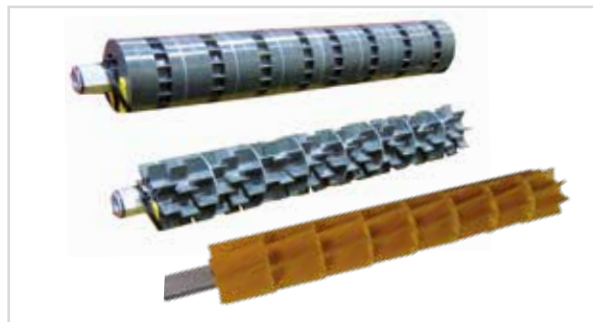
STUBBLING AND SEEDING IN ONE PASS

INTEGRATED SEEDER FOR COVER CROPS

The EU nitrate directive aims to protect water resources classed as vulnerable with 50mg nitrate/l. One of the measures considered to avoid nitrate leaching in the water source is the systematic coverage of soils by a vegetal cover in autumn. This cover will absorb nitrogen from the soil and air, and converts it into organic nitrogen compounds. The cover will then release nitrogen to the next crop (1/3), hereby improving soil structure and protecting it from erosion.

a-drill 200 (200l) used for small seed rate and a-drill 500 (500l) preferred with higher seed rate (25 to 50kg/ha - mix of seeds, grass, etc.) have been designed to meet a rapid implementation of cover crop during stubble operations while minimising costs. In addition, the a-drill can also be used for establishing rape seed or mixtures of different diameters seeds (leguminous plant, cruciferous, etc.).

The a-drill 200 & 500l can be equipped with two types of fan: electric recommended for small seeds allowing seed rates of 4kg/min or hydraulic for rates up to 14kg/min.



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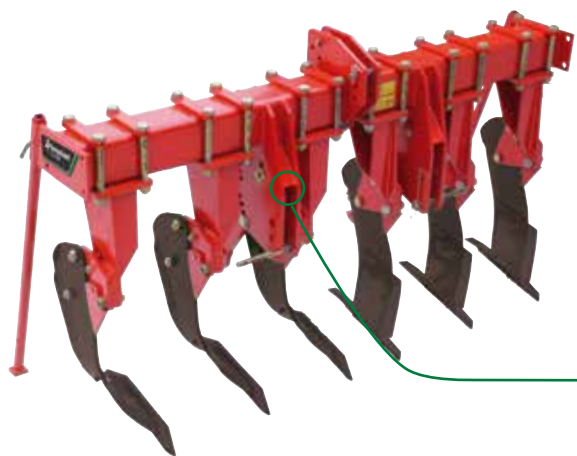
TECHNICAL DATA

| Model | CLI 300 | CLI 400 | CLG-II | Flatliner 300 | Flatliner 350 | DTX 300 SB** | DTX 300 AR** |
|---|--------------------------------|--------------------------------|--|----------------|---------------|-----------------------------------|----------------------|
| Frame | mounted rigid | mounted rigid | mounted rigid | mounted rigid | mounted rigid | mounted rigid | mounted rigid |
| Working width (m) | 3.00 | 4.00 | 2.20 - 5.60 | 2.61 | 3.15 | 3.00 | 3.00 |
| Transport width (m) | 3.00 | 4.00 | 2.20 - 5.60 | 3.00 | 3.50 | 3.00 | 3.00 |
| Underbeam clearance (mm) | 1,175 | | 860 | 700 | 700 | 550 | 550 |
| Frame size (mm) | 200 x 200 x 10 | | 100 x 100 x 6 | 150 x 150 x10 | | 180 x 180 x 10 | |
| Tines | | | | | | | |
| Tine | Curved CLI | | CLC or CLG | Pro-Lift or LD | | Pro-Lift or LD | |
| Number of tines | 4 / 6 | 6 / 8 | 2 - 13 | 3 or 5 | 5 | 5 | 5 |
| Tine spacing (cm) | 70 / 50 | 62.5 / 50 | 60 | 87 / 57 | 63 | 60 | 60 |
| Max. working depth (cm) | 40 | 40 | 50 | 50 | 50 | 40 | 40 |
| Tine overload protection | shear bolt | | auto-reset leaf spring | shear bolt | | shear bolt | hydraulic auto-reset |
| Max. release force (kg) | 2000 | 2000 | 1200 | 5200 | 5200 | 4400 | 1740 - 2900 |
| Other equipment | | | | | | | |
| Rear roller | ○ (cage roller Ø550) | | - | DD600 | | DD600 / Actipack / Actipress Twin | |
| Gauge wheels | ○ | ○ | ○ | - | - | - | - |
| Combination with a-drill 200/500 | - | - | - | - | - | ○ | ○ |
| Disc section with standard discs | - | - | - | - | - | ● | ● |
| Disc section with big notched discs | - | - | - | - | - | ○ | ○ |
| Disc section with standard in front & big notched discs in back | - | - | - | - | - | ○ | ○ |
| Rear finger harrow | - | - | - | - | - | ○ | ○ |
| Average power requirement (HP) | 100 (4 tines) 135 (6 tines) | 135 (6 tines) 180 (8 tines) | 140 (2 tines) 165 (3 tines) 210 (5 tines) 240 (7 tines) | 130-150 | 140-200 | 200-300 | 200-300 |
| Max. power requirement (HP) | 250 | 300 | 250 | 250 | 250 | 350 | 350 |
| Weight (kg) | 800 / 1,000 | 1,100 / 1,300 | 316 - 1,608 | 1,700 | 2,150 | 2,750 | 2,970 |

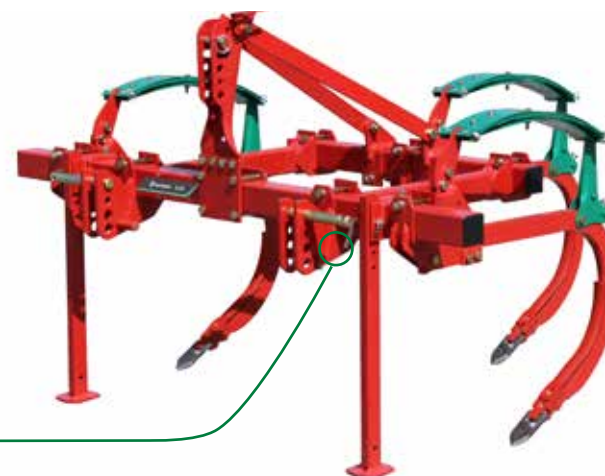
* Weights are given as an indication.

** SB = Shear bolt; AR = Auto-reset

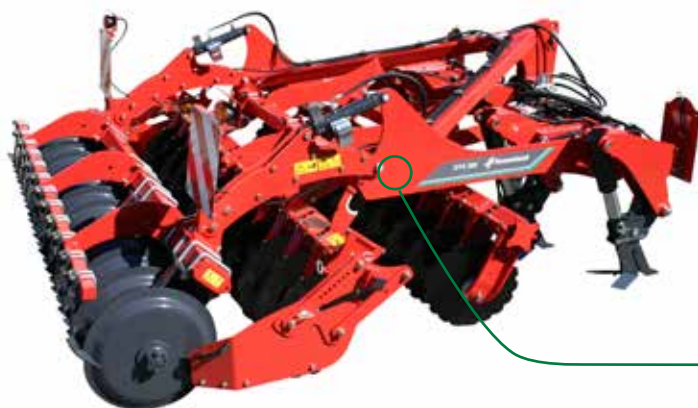
- Standard equipment
- Option
- Not available



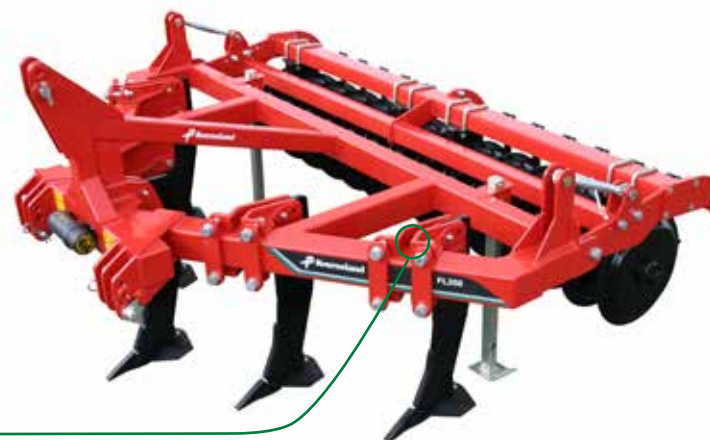
CLI single beam in
3.00 and 4.00m; 15-40cm deep



CLG-II 2.20, 2.90, 3.80, 4.70 and 5.60m;
50cm deep



DTX 3.00m; 40cm deep;
disc section 2 to 10cm deep



Flatliner 3.00m and 3.50m;
50cm deep

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