



PRODUCTION
CATALOGUE



Strip tillage is a combination of soil drying reduction and the benefits of soil heating — it has the advantages of conventional tillage in a system of soil protection technologies to create optimal conditions for seed development. This technology significantly reduces water erosion of the soil and improves the overall water regime in the soil.

Strip Till



ECO TILLER

Strip Till technology

The Eco Tiller 600 strip tillage machine was designed and developed as part of the TAČR project. VÚRV Jevíčko and VÚMOP Prague participated on this project. The machine has great ecological benefits. It reduces the intensity of tillage and water erosion, and at the same time helps to retain water on the land. The lower intensity of tillage with this technology reduces **oxidation of organic matter in the soil, thereby reducing CO₂ emissions and carbon losses from the soil compared to conventional full-area tillage**. However, for plants, this technology creates a soil environment comparable to conventional tillage. The economic benefits are also considerable. The same operational width requires up to 45% less tractor power compared to conven-

tional technologies. This results in lower fuel consumption and the need for lower tractor power while maintaining high-quality tillage. With the **Eco Tiller** technology, the user tills an average of four times less topsoil volume compared to ploughing technology, and this will really be reflected in economy. There is also a fourfold difference in the daily output of the machine in favour of the Eco Tiller compared to ploughing technology. **Eco Tiller 600** is technically designed to work very well in conditions with a large amount of plant residue on the soil surface, both after harvest (grain maize), and with a large amount of organic matter after a catch crop.

Strip Till

Muck Tiller

Strip Till technology combined with the application of digestate or liquid manure. **Muck Tiller** is based on the **Eco Tiller** frame (see Eco Tiller) supplemented with a cutting head and delivery system intended for sub-surface application. This type of machine is installed directly behind the application tank or self-propelled applicator. Tillage and application of liquid manure (digestate) in one pass are mainly done during autumn soil preparation. Crops sown in the spring are based on 75 cm or 45 cm row spacing.



Seed Tiller

Seed Tiller is based on the Eco Tiller frame equipped with a seed drill. It can have a pneumatic, hydraulic or electric metering system. Seed is placed in the soil with a no-till double-disc opener with a closing press wheel or with a deflector (wide sowing) with a harrow. For sowing with deflector, the width of the sown strip can be easily adjusted. Strip tillage with sowing is mainly used for crops with row spacing of 45 cm, 70 cm or 75 cm.



Ferti Tiller

Ferti Tiller is based on the **Eco Tiller** frame equipped with a front hopper for granular or liquid fertilizer and a distributing head. The hopper holds 1000 to 2000 litres. Liquid fertilizer tanks carry 800 to 1500 litres. The fertilizer can be applied in two different depths. The fertilizer rate is always set on the front hopper. Strip tillage with fertilizer application is mainly used for crops with row spacing 45 cm, 70 cm or 75 cm.

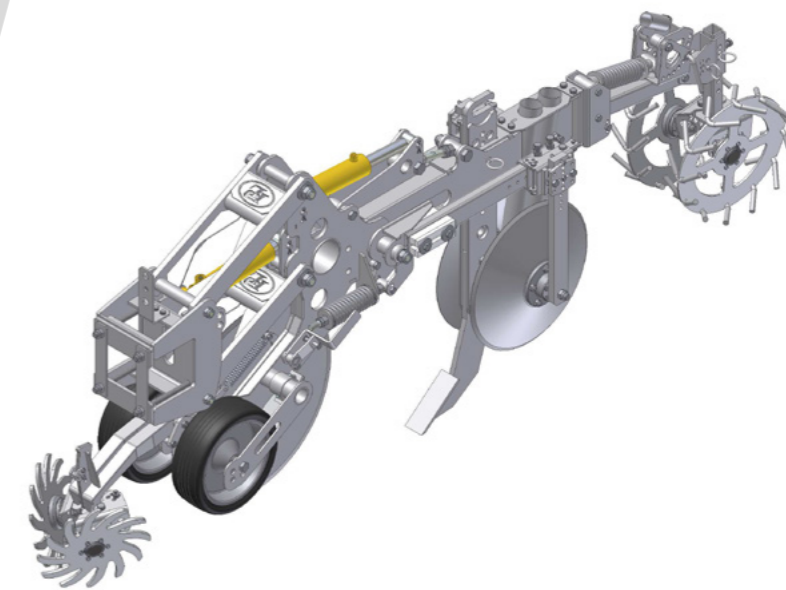




Strip Till

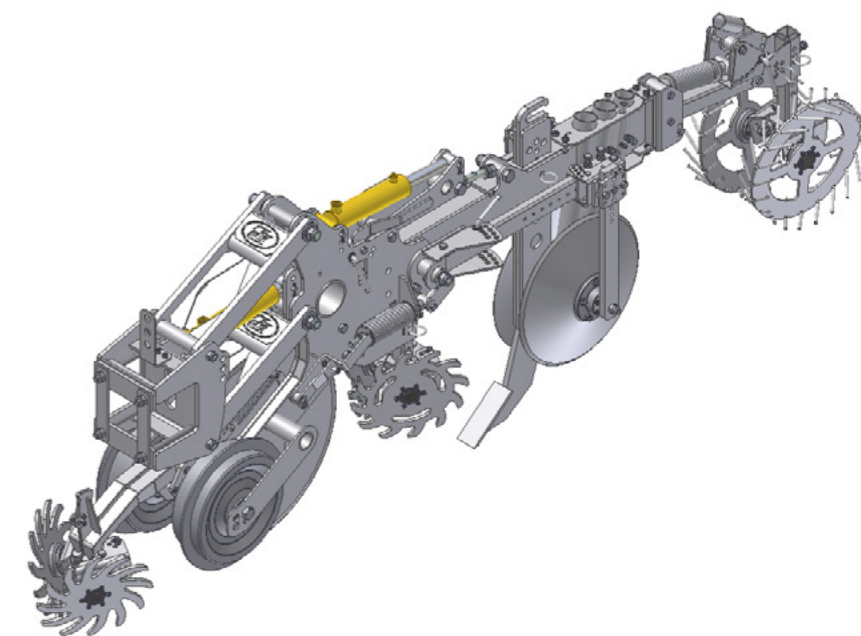
Standard row unit

The standard work units of the Eco Tiller are designed to work reliably in various soil types. Simple adjustment of partial working parts effectively influences the quality of work. The hydraulic adjustment of both the pressure force and the switch-off force for the work chisel provides the user with a significantly wider range of options that would not be possible with a spring solution. The hydraulic system, unlike the spring system, does not lose power after a few seasons of use. The coulter can be fitted with three sizes of chisel up to a width of 6 cm for intensive tillage. The rear crushing wheels play a very important role on the work unit. Their design and type can be chosen by each user according to their own experience or based on knowledge in specific soil and climatic conditions.



Extended row unit

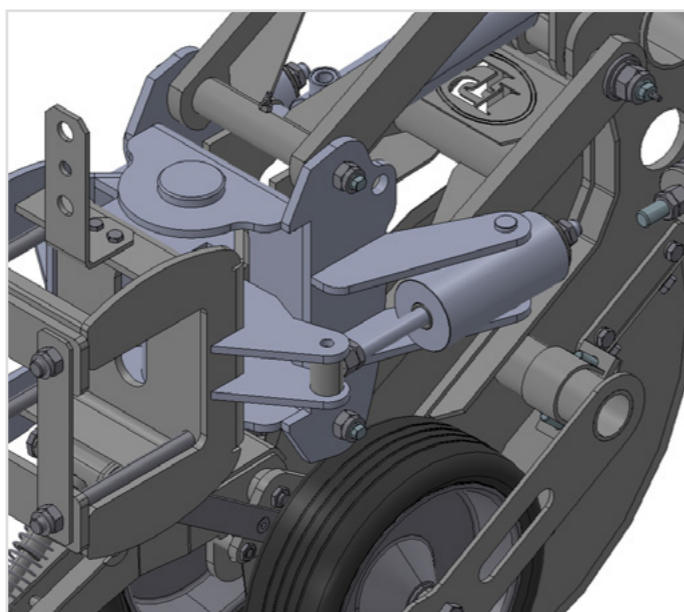
Where there is a large amount of crop residue from the previous harvest (from grain maize) on the surface of the plot or in cases where it is necessary to process a heavily connected high catch crop, Eco Tiller can be equipped with an extended working unit. This differs from the standard one in that a second row of finger cleaning wheels is placed in front of the working coulter. The aim is to remove as much plant residue as possible from the treated soil strip. The extended unit is designed to meet the demands of working with large amounts of plant residue.



Horizontal spring protection system for row units (a P&L patented solution)

We have concluded that work units for Strip Till need a system that allows horizontal swing. This technical solution protects the machine when working on rugged or irregular terrain, and wherever the operator is forced to abruptly change driving direction (bypassing columns, etc.). P&L's patented horizontal spring protection system is based on a solid central pin that has a pair of springs on both sides. These operate in both push and pull modes, depending on which side the work unit leans when the equipment turns. If the machine set is moving straight, the springs stabilize the unit perpendicularly to the machine's support frame. The maximum turning angle is 18° on either side.

Horizontal spring protection system for row units is useful for machine width from 8 to 12 rows, and especially for tractors with an articulated steering system. However, it is also applicable combined with self-propelled liquid manure and digestate applicators and powerful rear tractors with treads, when the rear of the applicator turns a lot during steering.



TECHNICAL DATA	MODEL		
	ECO TILLER 450	ECO TILLER 600	ECO TILLER 900
Working width	4500 mm	6000 mm	9000 mm
Transport width	3000 mm	3000 mm	3000 mm
Number of rows	6–10	8–12	12
Operating weight	2650 kg	3050 kg	3850 kg
Working speed	8–12 km/h	8–12 km/h	8–12 km/h
Required combination	25–35 HP/wheel	25–35 HP/wheel	30–45 HP/wheel
Working depth	150–330 mm	150–330 mm	150–330 mm



There are many advantages to inter-row loosening of the soil on fields with crop row spacing of 45 cm, 70 cm and 75 cm during vegetative season, together with targeted application of mineral fertilizers to the root zone of the plants. First of all, it is better for retaining water in the soil and thus reduce water erosion. Furthermore, research and practice have confirmed higher yields in the case of crops such as sugar beet, maize, soybeans, rape and others. Last but not least, inter-row cultivation reduces weeds, thus decreasing herbicide consumption.

Inter-row cultivation



CROPPER (FOR ROW SPACING OF 70 CM AND 75 CM)

Benefits of zone application of mineral fertilizers compared to conventional area application:

- Increase in grain yields by up to 1 ton per hectare.
- Improved the grain to straw ratio of silage maize.
- Shortened vegetation time by up to 5 days depending on the weather.
- Reduction of grain moisture by 1–1.5% at harvest time.
- Save 20–30% in mineral fertilizer consumption without compromising yield.

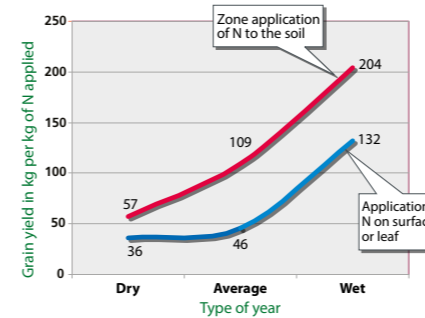
The Cropper inter-row cultivator is also a solution for large companies that can use special tool carriers. The great advantage of this design is placement of the working frame in the front of carrier. This version is very convenient for the machine operator, who thus has the loosening process under visual control. At the customer's request, the machine can be made offset or with a wheelbase of 1500 mm.



Inter-row cultivation

Cropper 6/8/12 is a very compact machine with a low tractor power needs. Soil cultivation and application of nitrogen and other nutrients in liquid fertilizers to the root zone of plants has a positive effect on water retention in soil, yield and environmental protection.

Production efficiency of different methods of nitrogen application



Cropper technology not only has a great impact on environmental protection, but also has great economic benefits for users. It can be seen from the chart that the grain yield per kilogram of nitrogen applied to the soil, i.e. to the root zone, can have up to a twofold effect compared to conventional application to the soil surface or leaf. Such results can only be achieved with a suitable liquid mineral fertilizer based on nitrogen, which, unlike granular fertilizers, works even under drier soil conditions.

The Cropper cultivator can be equipped with a seed drill for planting cover crops into maize rows. This procedure reduces soil erosion, adds organic matter to the soil and facilitates subsequent soil treatment after harvest. Significantly improves soil condition.



TECHNICAL DATA	MODEL			
	CROPPER 6	CROPPER 8	CROPPER 8 F	CROPPER 12 F
Working width	5100 mm	6750 mm	6750 mm	9750 mm
Transport width	3000 mm	3000 mm	2950 mm	3000 mm
Operating weight	1710 kg	2065 kg	1400 + 315 kg	2150 + 394 kg
Fertilizer tank volume	1400 l	1400 l	1000 l or 1600 l	1600 l or 1800 l
Flushing tank volume	30 l	30 l	80 × 20 l	100 × 20 l
Working speed	8–12 km/h	8–12 km/h	8–12 km/h	8–12 km/h
Required combination	75 hp	90 hp	100 hp	160 hp



MULTI CROPPER (FOR VARIOUS ROW SPACINGS)

Cultivation and fertilization during the vegetation of sugar beets, maize, vegetables or rape.

The Multi Cropper inter-row cultivator's unique technical solution distinguishes it from conventional similar machines. The machine frame can be easily converted from front-mounted version to rear-mounted version. The front-mounted version has the advantage that the operator can watch the machine work, and if the vegetation is sown precisely, with the help of GPS, no additional equipment is needed to guide the machine in the rows.

Automatic row guidance

If the user chooses to work with the Multi Cropper rear-mounted design, it is easy to attach the frame to the machine, which is equipped with cameras, a control unit and a hydraulic system for guidance in the vegetation at speeds above 10 km/h, see image.



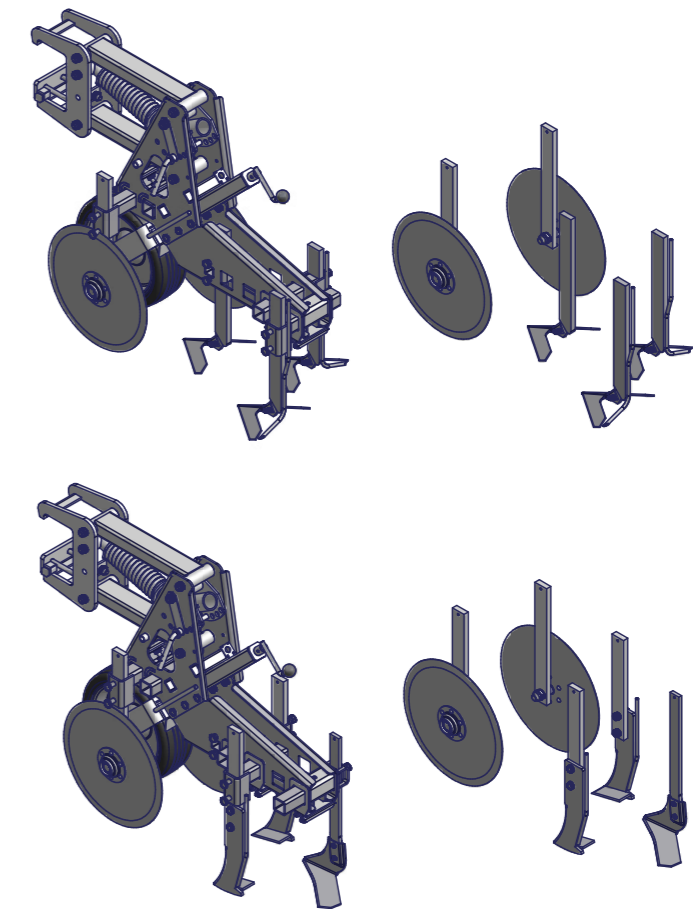
Inter-row cultivation

A set of three arrow chisel ploughs on a fixed shank with cutting discs

This set is part of the traditional design, when the bottom of the tilled soil strip is straight and shallow. These work tools leave the soil mostly crumbly, so this assembly is suitable for traditional cultivation on medium-heavy and heavy soils without risk of water erosion. Depending on the moisture conditions of the soil, penetration of the applied fertilizer is shallow and slow.

Version for shaping tilled soil bottom – flat chisels with a fertilizer feed and a flat plough.

This working tool assembly is patented. It is unique in that the chisels make a deeper furrow at the edges of the tilled soil strip. The central chisel works shallow. This creates a grave-shaped bottom in the tilled soil. In heavy rain, the grooves on the edges show considerably greater ability to catch water and thus limit both water and wind erosion. On the other hand, if there is inadequate rain, the furrow bottom shape directs water to the sides, i.e. to the plant roots and where the fertilizer is placed. The surface texture of the soil is much coarser than in the case of the traditional arrow plough. That also limits erosion. In this case, the fertilizer penetrates the soil faster toward the plant roots.



TECHNICAL DATA	MODEL		
	MULTI CROPPER-12/8	MULTI CROPPER-18/12	MULTI CROPPER-24/16
Number of rows sugar beet/corn	12/8	18/12	24/16
Transport width	2980 mm	2980 mm	2980 mm
Height	3750 mm	3965 mm	3965 mm
Operating weight	930–1540 kg	1515–2167 kg	1515–2656 kg
Fertilizer tank volume	1000 l / 1600 l	1000 l / 1600 l	1000 l / 1600 l
Working speed	8–12 km/h	8–12 km/h	8–12 km/h
Required combination	100–140 hp	140 hp	160 hp



Grassland maintenance is necessary for proper animal nutrition on pastures and is the basis for large, high-quality fodder harvest on meadows. The Ripper seed drill is currently the most efficient technology for permanent grasslands, because germination of sown crops is around 80%. This is due to the machine's technology, which allows seeds to be placed in the soil — never on the surface — under practically any conditions. The Ripper can be used to seed common cash crops in various tillage conditions before sowing, such as No-Till, minimization, and after ploughing.

Seed drill combination



RIPPER AND RIPPER HD

For renewal and sowing of pastures and meadows, including the sowing of conventional crops such as cereals, rape, legumes and others.

The main structural element of the sowing combination is a solid frame, which is a prerequisite for quality work in difficult or stony soil conditions on permanent grass cover. The machine works precisely even on arable land in No-Till or Min-Till technology. If the coulters part is disconnected, the separate seed drill can be used as a semi-drill for sowing cereals, legumes, oil seeds and other crops.

The main technological advantage of the standing Ripper is that it uses corrugated cutting discs (coulters) for preparation of the seedbed. Thanks to this technology, the field germination of seeds sown on permanent grass cover is over 80%.

In other systems, such as surface seeding or haphazard pressing into soil in rows, germination is low and seed is wasted.

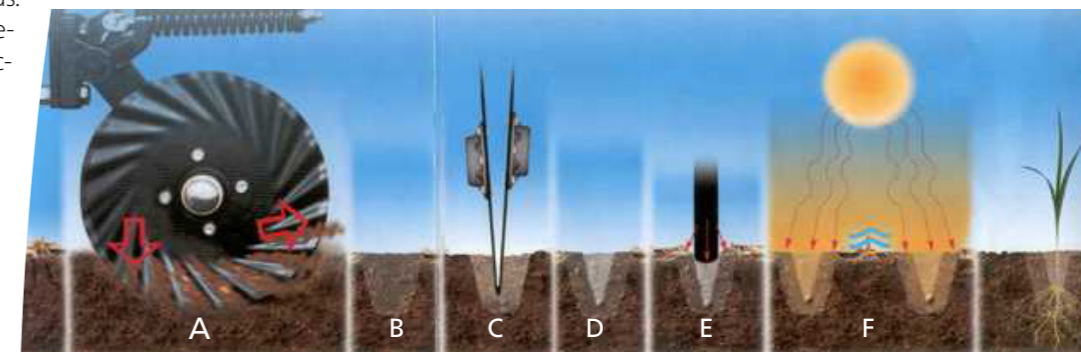


Seed drill combination

Preparing the seedbed isn't easy in meadows and pastures. The Ripper seed drill is equipped with TURBO coulters which cultivate soil in strips, in which the solid row units place the seed. The coulters are mounted on flexible shanks which, together with spiral springs, provide the machine with outstanding protection against damage in stony soils. The Ripper seed drill creates the right conditions for seed storage without disturbing the meadow structure (grass sod). The very finely graded sowing gearbox allows a sowing range from 0.5 kg to 380 kg per hectare. The sowing unit consists of two rollers. The fine one is used for sowing grasses and small seeds, the large one for cereals and large seeds. The seeding device can be driven mechanically by the spur wheel or by electric drive.

Technological procedure for sowing

The coulters create a seedbed for the seed, removing any plant residue from the seed storage area (A). The coulters can replace the work of cultivators and compactors. The pressure per coulter can be up to 250 kg, which allows unlimited sowing in difficult to work soils. The soil is tilled only in strips for seed without tilling between rows (B). The two-disc boot (C) places the seed into the groove prepared by the coulter. Restoration of soil capillarity is ensured by the compaction wheel, which is also for setting the exact sowing depth (E). The treated soil strip (F) heats up significantly faster and thus promotes rapid emergence.



Two-chamber seed box

The Ripper seed drill combination can be equipped with a two-chamber seed box with two independent seed drills. This allows you to sow two different crops with different seeding rates. These crops can be sown separately, i.e. with each boot separately, or mixed by all boots in the proportions set for sowing. This solution makes it possible to sow different mixtures or the main crop with an auxiliary sub-crop. You can choose between two inter-row distances: 15.5 cm for the Ripper HD machine, and 13.5 cm for the new compact Ripper. The sowing combination can also be supplemented by applying liquid fertilizers or inoculants. Application of granular fertilizers is also possible in one of the two chambers of the seed box.

TECHNICAL PARAMETERS	RIPPER HD	RIPPER
Operational width	3.0 m	3.0 m
Distance between rows	15.5 cm	13.5 cm
Number of seeding units	19	22
Seed hopper	850 l*	850 l*
Weight	2300 kg**	2450 kg**
Required tractor power	from 120 hp	from 120 hp
Inoculator appl.	2 x 300 l	900 l (front)

* with 700/150 l double-chamber box

** weight option up to 600 kg (depending on soil conditions)



VARIOR 600

Furrow loosening technology with the option of applying fertilizer for potatoes

The Varior 600 potato cultivator is technologically designed for surface and subsurface cultivation of ridges and furrows to improve infiltration of water from precipitation or irrigation into the soil and to create suitable conditions for efficient use of nutrients from applied fertilizers. Two patents are pending on the Varior cultivator, one for the machine's overall innovative design, and second for the original application of fertilizers to plant roots at the beginning of emergence. These patents are valid throughout Europe.

When growing potatoes on the slopes, the greatest threat to the soil is water erosion. However, the Varior 600 cultivator is one of the few ways to protect potato ridges on the slopes from erosion to some extent. Tests (by VÚMOP) have shown that using the Varior cultivator increases the soil's retention capacity by more than 40% compared to the uncultivated version. If the grower repeats loosening until the time of emergence (preferably between rains), then efficiency is even higher.



Anti-erosion technology

The VARIOR cultivator uses star rollers to break up the crust on the surface of the furrows before the plants start to emerge, creating or restoring dents and dams in the non-rail furrow. It loosens the compacted soil at the edges of the rail furrow, which is formed after repeated crossings by the equipment, loosens and applies mineral fertilizers to the root zone of the plants in the non-rail furrow.

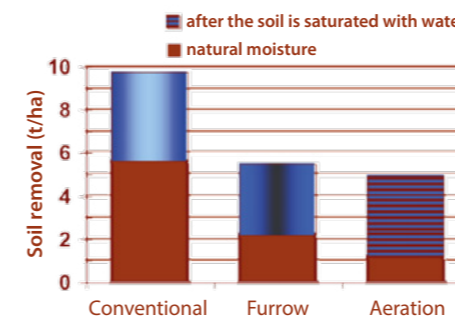
High retention capacity

Cultivating the surface improves infiltration of water from precipitation or irrigation and reduces run-off into furrows. The outflow of water from the furrow is limited by the dents and dams created, as show to the left of the image, where the cultivation was done with the VARIOR machine.

Automatic row guidance

Using ultrasonic transmitters that sense the relative position of the outermost ridges relative to the centre, the machine's hydraulic system receives instructions from the control unit to move the outermost sections on the support (blue) frame to replicate the generally inaccurate connection of the individual ridges resulting from two-row planting. The working position of the individual parts of the machine is easily adjustable with springs. The pump, electronic guidance control system and hydraulic valves are located on the support frame.

Soil loss due to water erosion was tested using a rain simulator before emergence of potatoes on slightly sloping land. The results show that formation of grooves on the surface of the ridges by the modulator during potato planting (shaped groove) and their loosening by machine. The Varior 600 reduced soil loss from water erosion. The measurements were performed by VUMOP Prague.



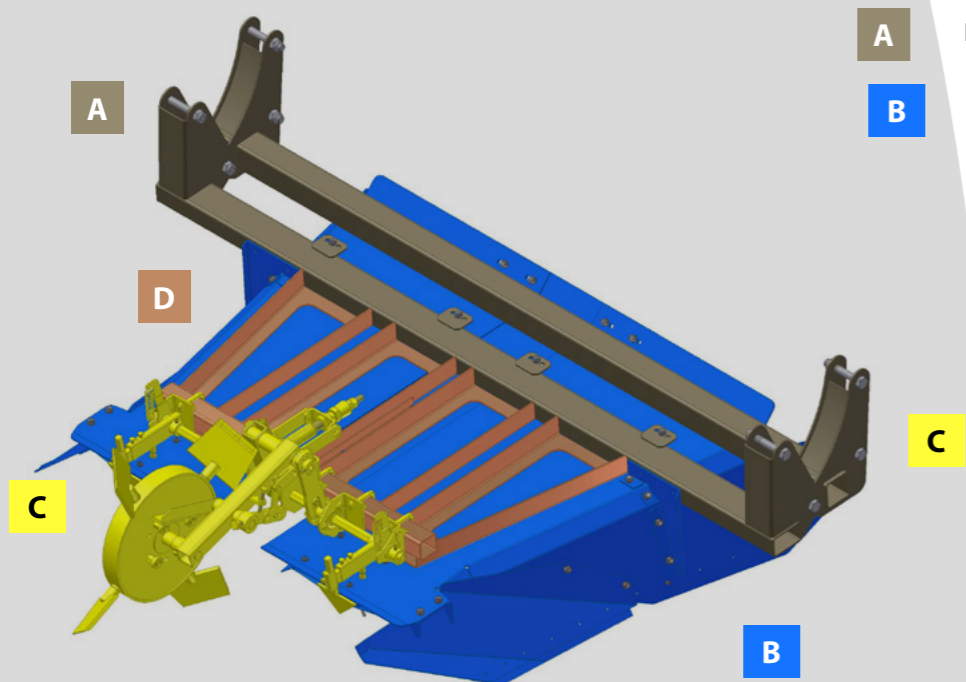
TECHNICAL DATA	MODEL
	VARIOR 600
Working width	5920 mm
Transport width	3000 mm
Weight*	1150–2050 kg
Dry weight without filling and tank	1100 kg
Tank volume	400 l

* Depends on tank used.

Source: VURV Praha



RIDGE MODULATOR FOR POTATO PLANTERS



A

Planter design.

B

Forming sheets

(For ridge modulator – type T and HDT)
Forms ridges with a cup-shaped ridge apex sloping toward the non-rail furrow (Fig. 1). At the top of the ridge, the soil can be disturbed by a longitudinal groove with removable spikes.

Stainless steel is used for production of replaceable slides in places of increased abrasion.

C

Equipment for denting and damming

(For ridge modulator – type HD and HDT)

Creates dams on top of ridges and dents in the non-rail furrow (Fig. 2). The frequency and depth of dams can be adjusted. The depth of the dents can be influenced to some extent by changing the pressure of the denting wheel, but this always depends on the amount of soil in the non-rail furrow. It has limited effectiveness in the unoccupied furrow.

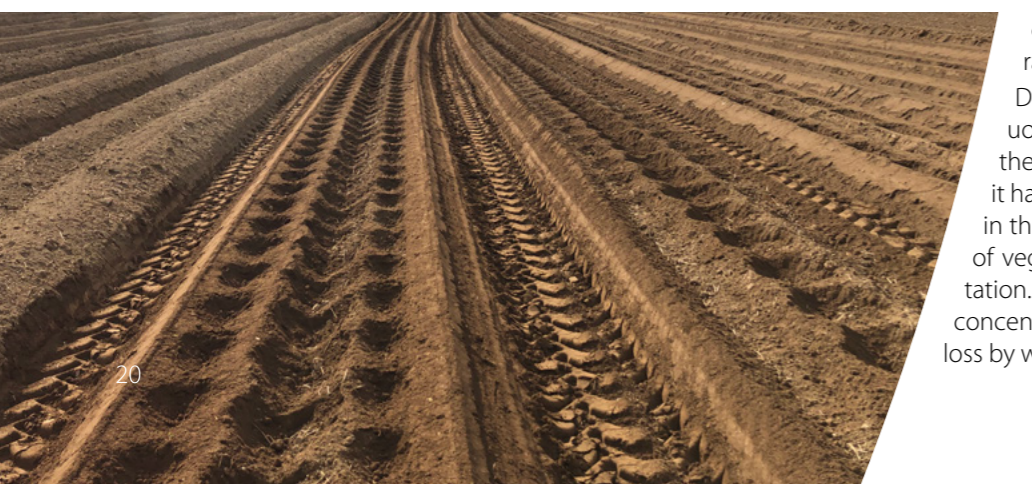
D

Planter design (Flowboard)

Produced in AWR and GB32 versions for attached planters. Custom solutions can be made for other planter types.

Ridges with a cup-shaped apex sloping toward the non-rail furrow. The overall widening of the top surface of the ridges, a slight sloping of their sides and the erosion of the non-rail furrow creates increased soil deposit for tubers. At the top of the dam, the soil is interrupted by a longitudinal groove. The increased area of the ridges enables greater rainwater retention.

Denting and damming creates a continuous or intermittent infiltration groove at the top of the dam. Properly implemented, it has a strong soil protection effect, especially in the period from planting to the emergence of vegetation and in the early stages of vegetation. At this time, potatoes are most at risk of concentrated surface runoff and subsequent soil loss by water erosion.



TERRIER

SUB-SURFACE BAIT APPLICATOR FOR VOLES



With the ban on the widespread application of rodenticides to the land surface and at the same time the very demanding manual application to burrows, sub-surface application is the only possible solution for the protection of crops from field voles.

The Terrier application working unit creates a sub-surface hole (continuous burrow) into which the vole bait is applied. This hides from other animals moving on the soil surface. The bait is applied mainly to outbreaks of vole, which reduces the dose, making this technology more environmentally friendly.

The cavity is created by a disc wheel, which cuts the soil, followed by a tunnelling device with a bevelled tip. A dosing tube with an application outlet is installed in the construction of the tunnelling device. The dosage depends on the rolling speed of the drive wheel for the Terrier applicator chain drive. The underground tunnel with applied bait ensures highly effective control of field voles and minimizes the threat to non-target animals.

The Terrier application unit works reliably in all soil types and it is possible to set the application depth, optimal soil pressure, or to choose different tool designs to minimize damage to the surface layer and cultivated crops.

The application unit can be adapted to the frame as customer requires, starting with just one unit. The machines can be supplied with frames 1.2 m wide for one application unit, 3 m for two application units and 6 m for three to four application units. Besides placement on a separate frame, a significant advantage of the application unit is also the optional placement on the frames of other machines (cultivators, weeders, etc.), or on the seed drill frame.





MUNICIPAL TECHNOLOGY

Light forest superstructures

Based on customer need, we produce light forest superstructures around the cab that meet the funding rules. For professional use, we custom manufacture full-fledged forest superstructures (around the cabin, chassis coverage, etc.). For all superstructures, we issue certificates for operation on public roads.

ROKI spreader

This is a mounted municipal spreader for salt, sand and solid industrial fertilizers. The hopper comes in 150 l and 250 l versions. The stroke width can be adjusted from 1.5 m to 8 m. Components that come into contact with the spreading material are made of AISI 240 stainless steel. Other parts of the machine receive an above-standard double treatment — hot-dip zinc and then powdered paint.

Snow ploughs

The specially lightweight plough produced 1.25 m to 2.4 m wide is primarily intended for the municipal services. The plough is continuously hydraulically adjustable on both sides at an angle of $0^\circ \pm 30^\circ$. The equipment also includes a bevelled abrasion-resistant rubber edge and adjustable support-guide wheels. The plough's safety tilting device individual stiffness adjustment options protect against damage to the tractor, the plough and the road itself.

Equipment for creation of running tracks

P&L has manufactured professional equipment for creating cross-country tracks. Together with the K9 2400 universal off-road vehicle, it works outstandingly in creating cross-country tracks for traditional skiing.

Custom production

We have plenty of experience and seasoned experts who can advise you on design and production of custom special equipment.



HISTORY

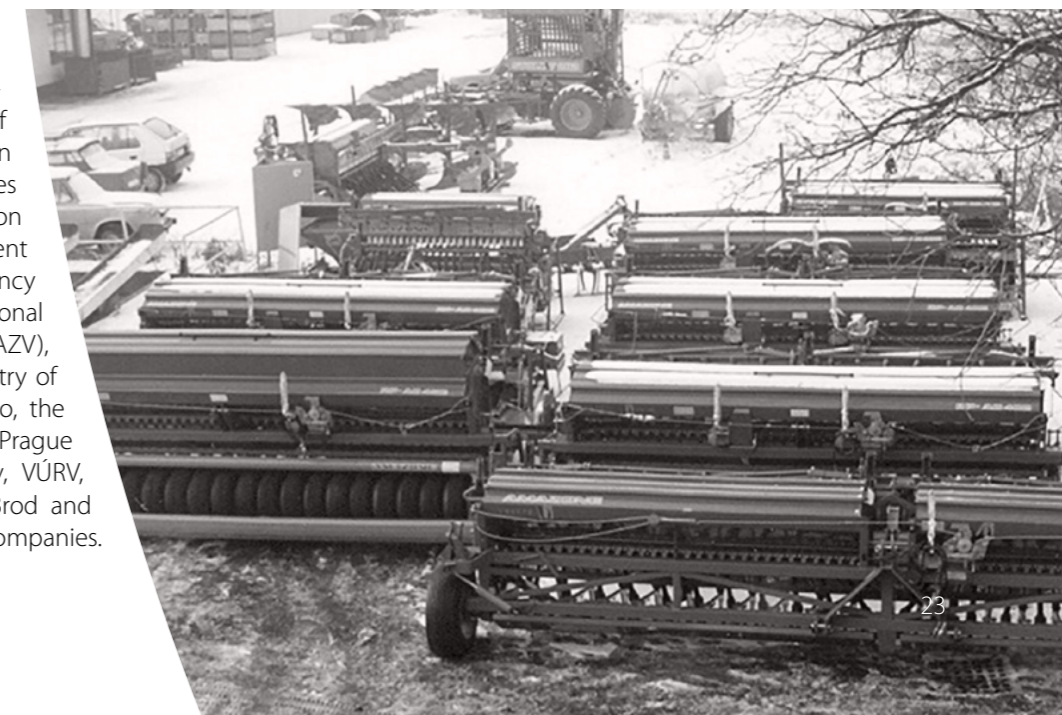
P&L was founded in 1990 by the engineers Luboš Pelánek and Petr Lebeda. The initial motivation was to bring interesting, proven technologies to Czechoslovakia from abroad. A small company was established, which over time has grown to its current form, employing over 150 people in the Czech Republic at eight branches with revenue exceeding CZK 600 million per year. It also operates in Slovakia through its subsidiary P&L Slovakia spol. s.r.o.

Over time, it has expanded its range to include sales of machines for the municipal sector. This became a very important area for the further P&L's further growth, and in 2010 resulted in the signing as exclusive representatives for KIOTI tractors.

During its existence, P&L has become a long-term stable company that sells a wide range of more than 20 world-renowned brands of agricultural, handling, forestry and municipal equipment.

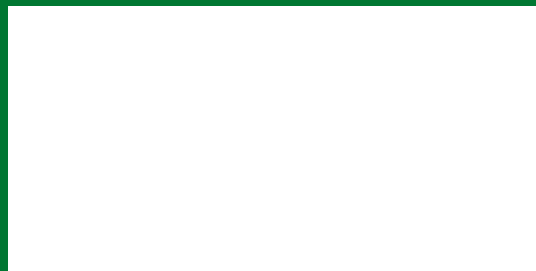
Along with machine imports, services also grew. This activity grew into sales and quick delivery of replacement parts to customers.

A need arose to address customers' individual needs for customization of machines already sold. These customizations gradually expanded to development of our own accessories and, finally, to production of our own machines intended mainly for strip tillage, inter-row and or sowing. Currently, in its own production halls, P&L produces over 10 types of agricultural and municipal machines and equipment designed in house, with years of development and a lot of innovation behind them. Most of these machines were created in long-term cooperation with Czech research and development agencies, such as the Technology Agency of the Czech Republic (TAČR), The National Agency for Agricultural Research (NAZV), and partners such as the Czech Ministry of Agriculture, Mendel University in Brno, the Czech University of Agriculture in Prague (CULS), VÚMOP, v.v.i. Prague-Zbraslav, VÚRV, v.v.i. Prague-Ruzyně, VÚB Havlíčkův Brod and many other partners and agricultural companies.





Your business partner



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Service backed by people



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