PPL – CULTIVATOR

6, 8 OR 12 ROWS

CULTIVATION AND VEGETATION FERTILISATION OF MAIZE AND SUNFLOWER

CONTROLLED NUTRITION OF MAIZE AND SUNFLOWER

Controlled nutrition of wide-row crops during the growing period through the zone application of liquid fertilizers with PPL cultivator in the soil, together with the "root targeted" application of fertilizer starting doses using the seeding machine, offers the complete vegetation nutrition of maize. Use of this system in practice has confirmed its advantages over the traditional surface application of mineral fertilizers, especially in terms of:

1. Increased grain yield by up to 1 tonne/hectare
2. Improved grain-to-straw ratio in silage maize
3. Growing period shortened by up to 5 days, subject to weather conditions
4. Grain moisture reduction by 1–1.5% in the harvest period
5. Mineral fertilizer consumption savings by 20–30%, without effect on yield

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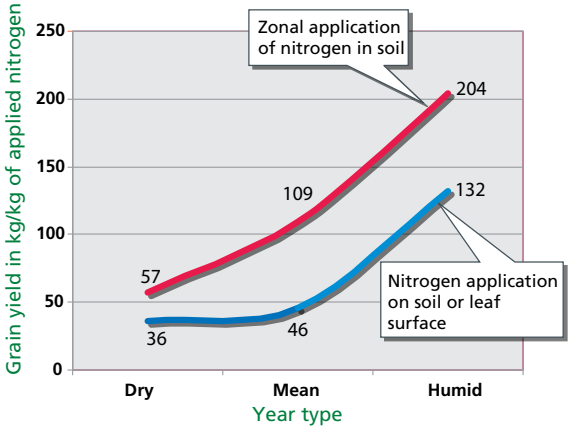
CULTIVATION AND VEGETATION FERTILISATION OF MAIZE AND SUNFLOWER

PROFITABLE PLANT NUTRITION RESPECTING ENVIRONMENTAL PROTECTION CONDITIONS

- PPL cultivators are designed for row cultivation of soil and the application of liquid fertilizers to the roots of maize and sunflowers. The effect of row cultivation is very favourable for maize growth. Weeds are mechanically destroyed; the soil is strip cultivated and aerated. Aeration reduces moisture evaporation and improves soil water regimen.
- The cultivator with zone application of liquid fertilizers is the ideal supplement to "root targeted" fertilization when planting.
- Economic benefits of using the cultivator for liquid fertilizer application include a quick return on investment thanks to the reduced quantities of fertilizer applied in the soil compared to traditional surface application.
- Subject to soil and climatic conditions, mineral fertilizer costs can be reduced by up to €60–70/ha, depending on current fertilizer prices.
- Zone application of liquid mineral fertilizers greatly reduces environmental damage compared to traditional methods of fertilizer application on the soil surface or plant leaves.

Production efficiency of various methods of nitrogen application



Liquid mineral fertilizer applied into the soil is the best solution for the maize supplementary vegetation fertilizing.

The PPL technique is not only very environment-friendly, but also extremely economically beneficial for the user. The graph shows that grain yield per one kilogram of nitrogen applied in the soil, i.e. in the root zone, may result in up to double the effect of a traditional application on the soil or leaf surface. These results can only be achieved with an appropriate nitrogen-based liquid mineral fertilizer which, unlike granulated fertilizers, is more effective even under dry soil conditions.

WHERE EXACTLY IS THE ECONOMIC BENEFIT OF PPL SYSTEM?

According to the methodology of maize growing, this crop has a nitrogen growing uptake in the range of 180–220 kg/hectare. Hence the farmer should supply the same amount of nitrogen to the soil before or in the course of seeding, and during the growing period. If the PPL system is used for fertilization in the course of the growing period, the total quantity of nitrogen may be reduced by about 30%, i.e. by about 50 to 60 kg without affecting or reducing the yield.

The reason is that nitrogen applied zonally to the soil in liquid form is taken up much better by plant root systems than when applied onto soil or leaf surfaces in the usual way. If the saved – i.e. not purchased – nitrogen (in kg) is multiplied by the cost price, including the price of application, and that sum is further multiplied by the number of maize hectares, you will find return on investment in the PPL system amounts to about 400 ha of maize field area.

CULTIVATOR PPL-6

CULTIVATOR PPL-8

CULTIVATOR PPL-8 FRONT

CULTIVATOR PPL-12

TECHNICAL DATA	MODEL			
	PPL-6	PPL-8	PPL-8 FRONT	PPL-12 FRONT
Length	2,850 mm	2,850 mm	1,820 mm	2,765 mm
Working width	5,100 mm	6,750 mm	6,750 mm	9,750 mm
Transport width	3,000 mm	3,000 mm	2,950 mm	3,000 mm
Transport height	2,960 mm	2,960 mm	3,950 mm	2,970 mm
Operating weight	1,710 kg	2,065 kg	1,400 + 315 kg	2,150 + 394 kg
Fertilizer tank volume	1,400 l	1,400 l	1,000, 1,600 or 1,800 l	1,600 or 1,800 l
Flush water tank volume	30 l	30 l	80 + 20 l	100 + 20 l
Working speed	8–12 km.h^{-1}	8–12 km.h^{-1}	8–12 km.h^{-1}	8–12 km.h^{-1}
Required aggregation	75 Hp	90 Hp	100 Hp	160 Hp

* tank weight

ROBUST FRAME DESIGN

The frame consists of a robust profile with mounted hydraulics for easy tilting between working and transport positions. The transport position gives the operator a clear view to ensure safe transport on public roads.

PUMP DRIVE FROM GAUGE WHEEL

Simple dose setting in the range of 70 to 170 $l.ha^{-1}$. The dosing pump is powered by the gauge wheel via a sprocket gear. Changing the sprocket changes the fertilizer dose.

BIG FERTILIZER TANK

Big liquid fertilizer tanks – 1800 l for PPL 12 front and 1400 l for PPL8.6 – guarantee high machine performance. A clean water tank enables easy flushing of the distribution system and filters at the end of the shift.

STELLATE CULTIVATING WHEELS

Star cultivating wheels with fertilizer application discs for breaking the soil crust work well in light compaction conditions when operating on medium soils.

FERTILIZING SYSTEM WITH COULTERS

Application units with coulters are designed for soil protecting techniques where there are extensive organic residues on the soil surface. The protective function of mulch is not affected and they prevent the clogging of working tools.

HIGH OPERATING SPEED

High operating speeds of up to 12–16 $km.h^{-1}$ allow a daily PPL-12 performance of up to 80 ha, with low fuel consumption.

INTER-ROW UNDER-SEEDING

PPL cultivator with seeding machine

Seeds for the inter-row under-seeding of maize are laid using a "V" shaped diffuser just in the strips of the cultivator prepared soil. Thus the growing maize has no competition from the growing under-seed.

At the time of under-seeding with the PPL cultivator (3–6 maize leaf), the maize enjoys the advantage of engaged growth. The under-seed stops growing at a certain stage and its vegetation is minimized by the maize overgrowth.

The inter-row PPL cultivator can be equipped with an electric seeding machine that distributes seeds in the strips of cultivated soil. Mixtures suitable for this technique include hybrid rye grass and strangle weed. The sowed crops must be tolerant and not aggressive, so as not to become potential competitors for the maize, also in terms of soil moisture.

Main benefits:

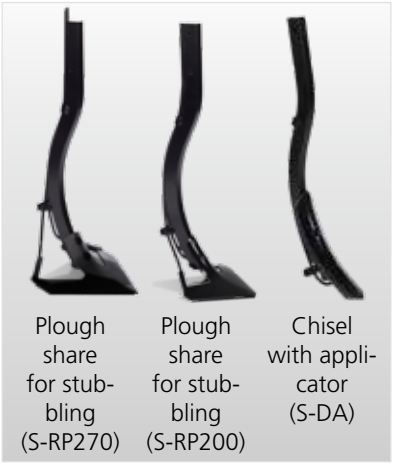
- Support for soil structure and protection against soil erosion
- Supply of high-quality organic matter into the soil
- Firm turf – limits the formation of ruts and soil compaction in the course of harvest
- Limited washing up of nutrients into groundwater
- Easier soil processing after harvest

WORKING UNIT – 3-POINT FIXATION
STANDARD EQUIPMENT OF THE PPL MACHINE

A standard working unit is constructed for mounting three working tools and forms the basic equipment of PPL machines. The unit comprises a robust structure with a copying wheel and ring for easy row follow-up.

The work unit can be fitted with two disc coulters (S-K), used to separate a soil strip from soil already with plants where the root system might be damaged. The coulters also protect plants against flying soil thrown up during aeration by working hoes. Where there are high quantities of plant residues between the rows, coulters with liquid fertilizer application (S-TKA) are recommended instead of the disc coulters. This alternative effectively prevents clogging of the machine with plant residues of interim growth, or from previous harvests of maize for grain.

The following variants are available as the main working tool for the standard work unit. The variant most frequently used for medium to heavy soils is the stubble plough share (S-RP 270), which also works effectively in medium-stony soil conditions. The stubble plough share (S-RP200) is used in combination with the application chisel (S-DA). This combination will widen the processed soil strip, and its main application area is medium-heavy soils. This set-up does not require disc coulters.



Plough share for stubbling (S-RP270) | Plough share for stubbling (S-RP200) | Chisel with applicator (S-DA)

Standard coulter (S-K) | Turbo coulter (S-TK) | Turbo coulter with applicator (S-TKA)

EXTENDED WORK UNIT – 5-POINT FIXATION

The extended work unit with 5 fixation points is designed for conditions requiring the formation of a cultivated strip with a finer texture and where the user requires frequent changes in width of the processed soil strip. The unit comprises a robust structure with a copying wheel and a ring for easy row follow-up.

In practice, any variant of work tool combination available for PPL machines may be used with the tool shape best applicable to the particular soil and stand conditions.

Extended work units cannot be used for front-mounted PPL machines.

Example of a set-up with five working tools