BEDNAR
FARM MACHINERY

Precise inter-row cultivation

ROW-MASTER

RN, RN_S

ROW-MASTER RN

General description

MAIN ADVATAGES OF THE MACHINE

- **Maintenance-free paralellogram linkage** of the units with a support depth wheel.
- **Precise optical self-guiding system CultiCam from the start of the crop growth**.
- **The silent-block seating of the working units** increases their down-pressure on the soil.
- **3 types of cultivation shares** – shares for early cultivation, shares for late cultivation, and ridging shares.
- **Crop protection** provided by the discs or side screen.
- **Adjustable working sections of each unit** according to current field conditions.

ROW-MASTER RN and RN_S cultivators are designed for inter-row cultivation (disruption of the soil crust) and weed regulation in maize, sunflower (RN) and sugar beet (RN_S) crops. The cultivators have variably adjustable working sections of each working unit so as to be able to react to current soil conditions and the size of the crops. Maintenance-free silent-block seating of the working units produces down-pressure on the support wheel and maintains a precise working track of each unit.

BEDNAR ROW-MASTER can be equipped with the scanning optical system CultiCam to monitor the crops. CultiCam can, for instance, navigate the machine as early as from the emergence of 2 genuine sugar beet leaves which allows very early cultivation.

AGRONOMIC ADVANTAGES OF THE MACHINE

- Inter-row cultivation gives a **significant improvement to the growing conditions** for wide-row crops during the growing season.
- **Disruption of the soil crust after rain** means more air for the crops which can then keep growing without problems.
- **Creation of an insulation layer** in a dry season. Soil moisture remains at the root system. Use of a weeder reduces evaporation.
- **Mechanical weed regulation** in the growing season of the crop r**educes the cost of chemical protection**.

"With decreasing availability of soil, there is a growing need for increasing yields. Use of a weeder is an efficient way of cultivation which significantly improves the conditions of the rootw crops and helps the crops to better overcome stressful situations in the growing season. Furthermore, it significantly reduces the costs of chemical protection."
Jan Bednář

ROW-MASTER

Benefits

Benefits that bring savings:

- **Quality soil preparation with a single pass:** the inter-row ROW-MASTER cultivator loosens the soil between the crop rows, removes the soil crust, disrupts weed growth and creates an insulation layer during a dry season.
- **Increased cultivation accuracy and enhanced performance at the same time:** The Row-Master can be equipped with the crop monitoring optical system, CultiCam which can navigate the machine accurately along the rows. The operator works comfortably and provides excellent performance.
- **Variability of the machine for various conditions and growth stages:** the technical design of the machine allows pre-setting of the machine according to current conditions. The machine is highly adjustable, with various accessories suitable for current soil conditions and the current stages of the crop growth.

ROW-MASTER

Use

ROW-MASTER can be used for:

- **Soil crust disruption after torrential rain.**
- **Making air available to roots.**
- **Disruption of the solid soil crust in a dry season** to create a protective insulation layer.
- **Regulation of weeds between rows of production crops.**

ROW-MASTER RN SERIES

Versatile cultivator

Basic description of the versatile Row-Master RN inter-row cultivator:

- **Universal frame for various types of working sections** depending on the crop type (maize, sunflower, sugar beet, etc.)
- **Robust cultivator frame** for cultivation even in very challenging conditions
- **Frame with high a clearance of 80 cm for crops such as maize, and sunflower, etc.**
- **Variable inter-row spacing of** 45 cm, 50 cm, 60 cm, 70 cm, 75 cm and 80 cm
- **The possibility of side-dressing using both solid and liquid fertilizers**
- **Self-guidance system CultiCam**

ROW-MASTER RN_S SERIES

Expert on sugar beet

Basic description of the Row-Master RN S, inter-row cultivator for sugar beet:

- **Specialized cultivator** for inter-row cultivation of sugar beet crop
- **Light cultivator frame** for small, light-weight tractors
- **Frame with clearance of 42 cm**
- **Variable inter-row spacing** of 40 cm and 45 cm
- **Self-guidance system CultiCam**

Maize technology

WATER INTAKE, KEY TO HIGHER YIELDS IN BOTH DRY AND WET YEARS

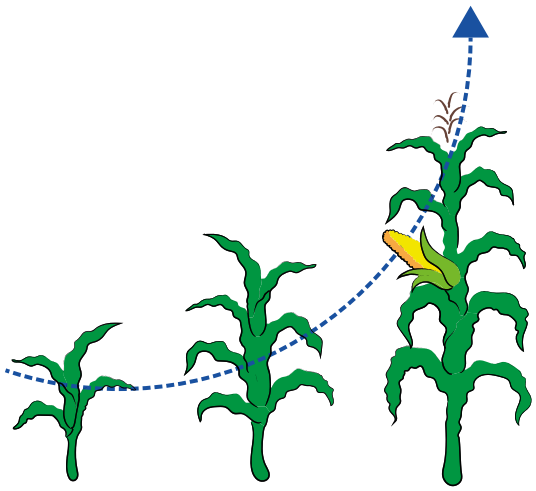
You cannot influence the amount of precipitation but you can influence how your plants make use of water. Active water intake is the key to higher yields in both dry and wet years. To achieve a higher yield, it is therefore vital to understand how water behaves in soil.

Basic soil characteristics with functioning water intake:

- **Infiltration:** the soil structure must ensure good infiltration (absorption). For example, it prevents soil crust or disrupts the base.
- **Permeability:** easy movement of water in soil layers, downwards as well as upwards towards the root.
- **Percolation:** ability of soil to deal with excessive amounts of water by taking the water to deeper soil profiles.
- **Soil maturity:** ability of soil to absorb water, as well as to retain water in a dry season.

Compacted, blocked soil is like concrete. This means zero or reduced water absorption ability in case of heavy rainfall. On the contrary, in a dry season it will not allow the root system to access groundwater.

Soil cultivated to depth without a compacted layer acts like a sponge. Such soil is able to accept a large amount of water. In a dry season, maize roots can take in groundwater.



Tillage methods that significantly contribute to increased maize yield:

Deep soil tillage – maize requires soils with deep tillage so as to be able to develop its **extensive root system** and thus create favourable conditions for intake of water and nutrients. Thanks to deep tillage, compacted layers are disrupted, water intake starts and soil is enriched with air.

Use of a weeder – maize responds very positively to inter-row cultivation (use of a weeder) during the vegetation period, particularly as a result of the removal of the soil crust that prevents water intake. Furthermore, the use of inter-row cultivation for application of solid or liquid fertilizers is recommended."

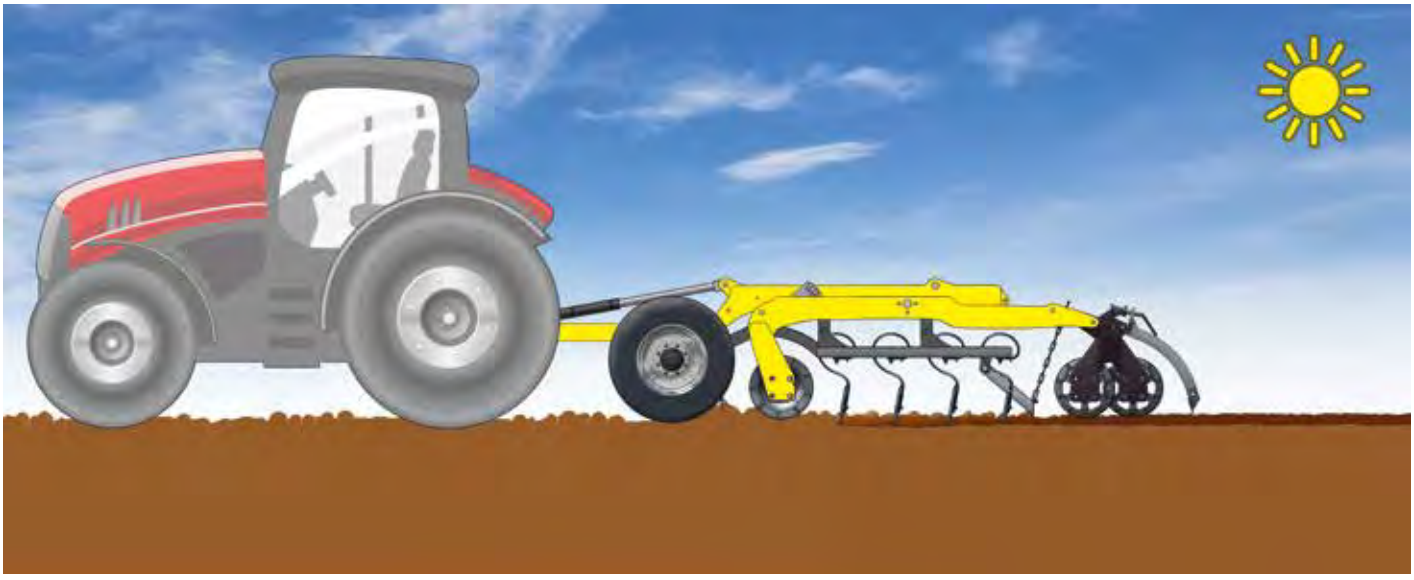
Comparison of the root system of silage maize
– Deep fertilization, cleared with a weeder
– Ploughing, no fertilization, not cleared with a weeder

The root system of grain maize
– Deep fertilization, cleared with a weeder

Maize technology

AUTUMN – DEEP TILLAGE USING A TERRALAND WITH STORAGE FERTILIZATION FROM FERTI-BOX

SPRING – SPRING PRE-SOWING PREPARATION USING A SWIFTER WITH GAMMA TINES

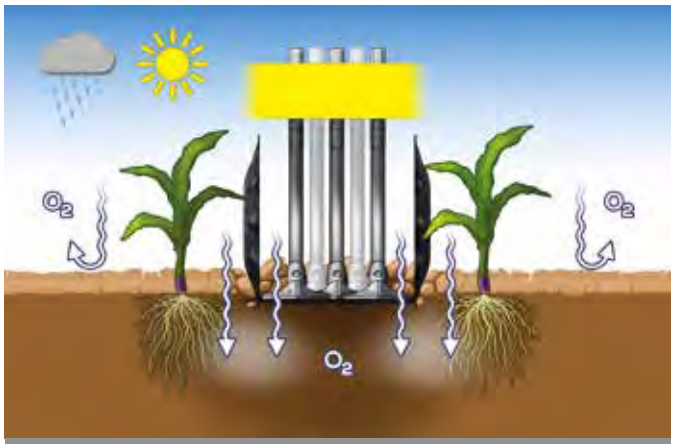


VEGETATION PERIOD – INTER-ROW CULTIVATION USING A ROW-MASTER

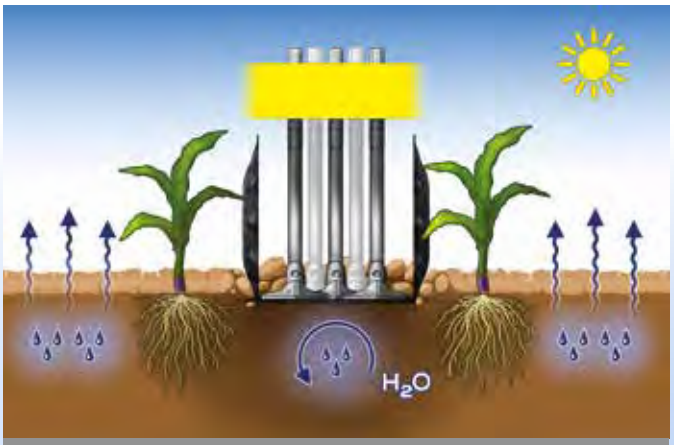
CLEARING MAIZE WITH A WEEDER IS A WAY TO ACHIEVE HIGHER YIELDS

If you are contemplating increasing the intensity of growing maize, inter-row cultivation is a field operation that should be part of your technology. **Use of a weeder significantly increases the vitality of the crop.**

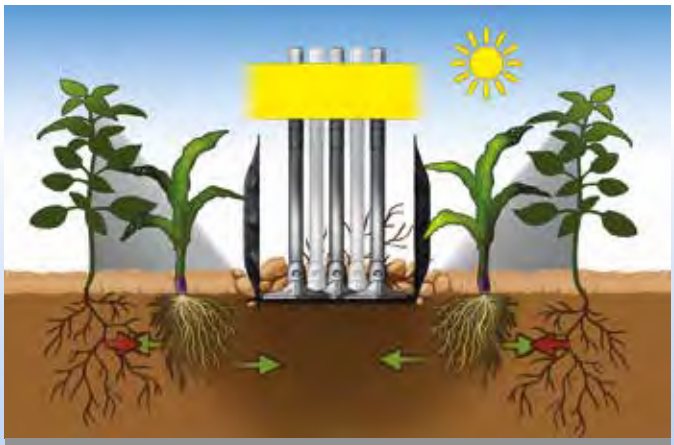
In order to grow, maize needs warm temperatures, air and water. Use of a weeder can have a positive influence on the amount of air in soil as it disrupts the soil crust that causes big problems, especially after heavy rain and particularly on soils susceptible to formation of soil crust.



Access of air to roots – removal of the soil crust



Interruption of capillarity in rows means reduced evaporation in a dry season



Weed clearance

ROW-MASTER RN SERIES

Basic description

Self-guidance system with CultiCam, guides the cultivator to the rows.

Maintenance-free paralellogram linkage of the working units.

Increased down pressure of the working units thanks to the silentblock seating of the units.

Support wheels for each working unit with setting of the units´ working depth.

ADJUSTABLE ROW WIDTH

The spacing between the individual working units can be changed easily by loosening the screws that connect the main frame of the machine with the working units.

WORKING UNITS FOR SUGAR BEET

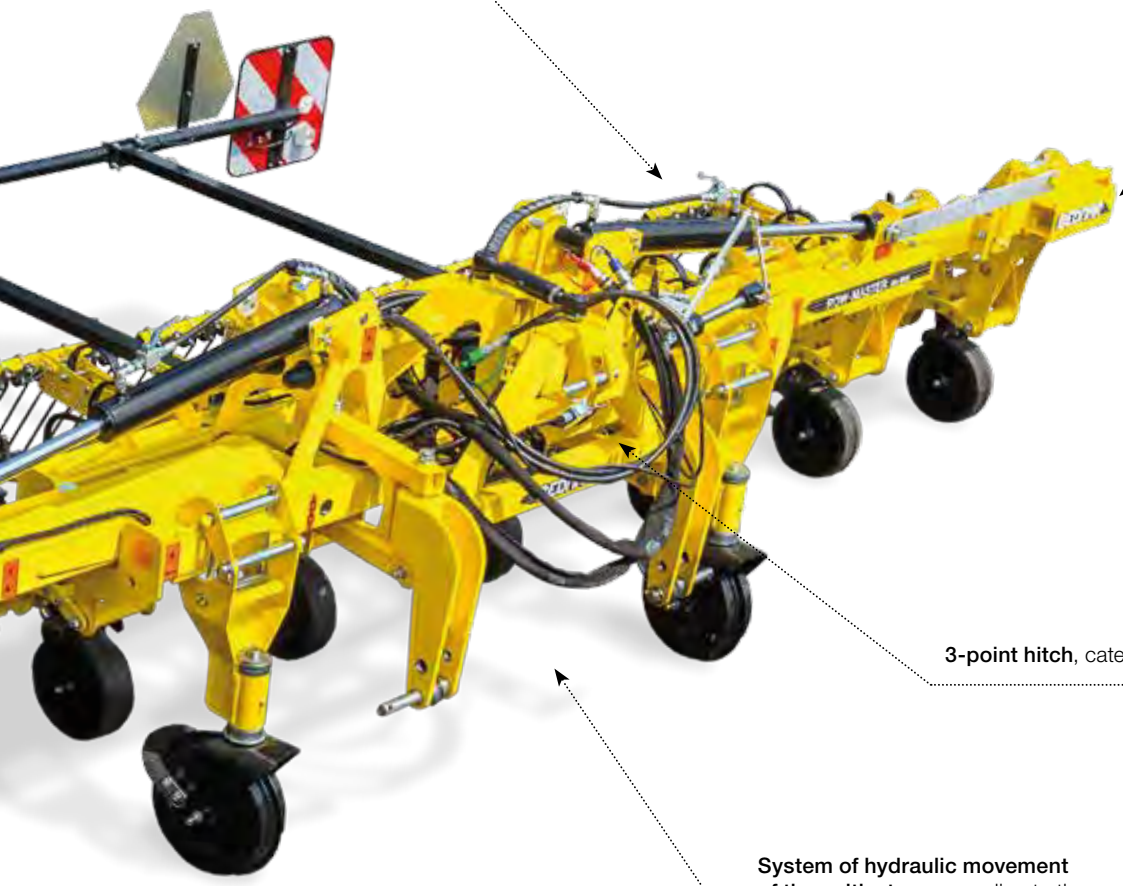
Working units of a Row-Master RN intended primarily for inter-row cultivation of maize and sunflowers can also be adjusted to inter-row spacing for sugar beet.

SIDE-DRESSING

Row-Master RN allows side-dressing with solid or liquid fertilizers behind the working sections of the inter-row cultivator.

Universal frame with the possibility of various working units for maize, sunflowers, etc. or working units for sugar beet.

Cultivator frame clearance of 80 cm.



3-point hitch, category II and III.

System of hydraulic movement of the cultivator responding to the information received from CultiCam.

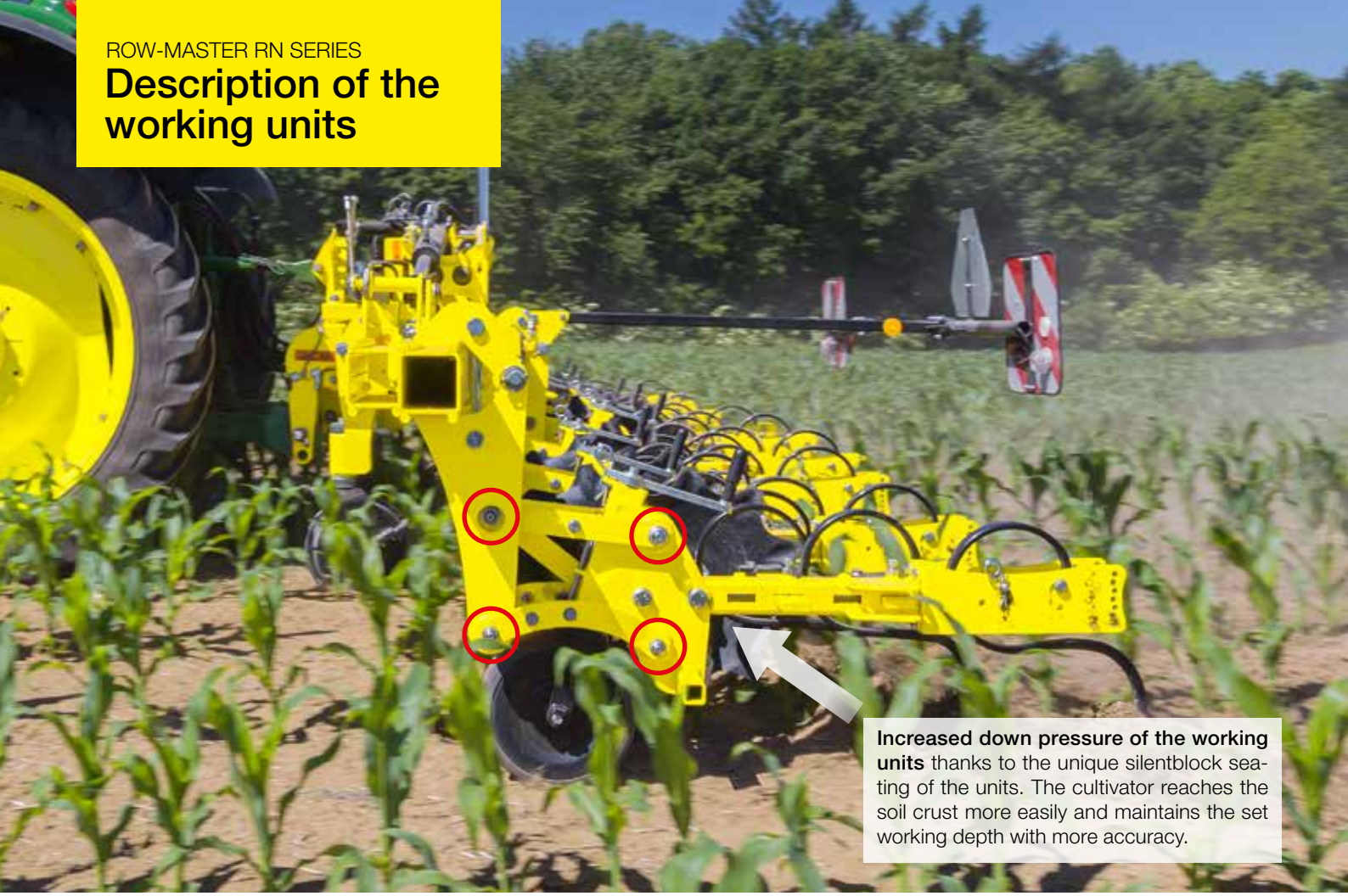
Stabilizing control steel wheels guide the cultivator through the crop.

ROW-MASTER		RN 4500	RN 6000	RN 9000
Number of rows	pcs	6	8	12
Working width	m	4,5	6	9
Working depth*	cm	2–12	2–12	2–12
Inter-row spacing	cm	45, 50, 60, 70, 75, 80	45, 50, 60, 70, 75, 80	45, 50, 60, 70, 75, 80
Number of shares early cultivation (5 pcs unit)	pc	31	41	61
Number of shares and chisels	pc	19/12	25/16	37/24
Number of shares and chisels for more demanding conditions	pc	6	8	12
Number of discs	pcs	12	16	24
Total weight*	kg	1190–1440	1450–1700	2070–2380
Recommended output*	HP	60–70	80–90	100–120

* depends on soil conditions

Maize technology

Description of the working units



Increased down pressure of the working units thanks to the unique silentblock seating of the units. The cultivator reaches the soil crust more easily and maintains the set working depth with more accuracy.

END WORKING SECTIONS FOR VARIOUS STAGES OF THE VEGETATION PERIOD AND SOIL CONDITIONS

WORKING SECTIONS WITH 5 SHARES ON A WORKING UNIT

For first early spring inter-row cultivation we recommend that you use 150 mm shares with 100% covering. Each Row-Master RN working unit is equipped with 5 pcs of working shares (150 mm). The shares are mounted on flexi-tines.

This initial operation removes the soil crust and provides basic weed clearance of the rows. Weeds are pulled out of the soil and soil is shaken out of the roots, which makes the weed wilt faster.

WORKING SECTIONS WITH CHISELS AND SHARES

For subsequent loosening, it is recommended that you use the working section with 3 shares (150 mm) + 2 chisels (40 mm in width). Chisels are mounted to flexi-tines. At a later growth stage, soil is usually harder, and therefore we recommend that you use 3 shares plus 2 chisels instead of 5 shares. Soil is efficiently enriched with oxygen and it also retains moisture better.

WORKING SECTIONS WITH A CHISEL

In case that loosening on a heavier type of soils is carried out later, when the crop of e.g. maize has been sufficiently stabilized in the soil, it is ideal to loosen the soil deeper with a 60 mm chisel with a mouldboard. A large chisel loosens the soil and removes even a very hard soil crust.

ROW-MASTER RN SERIES

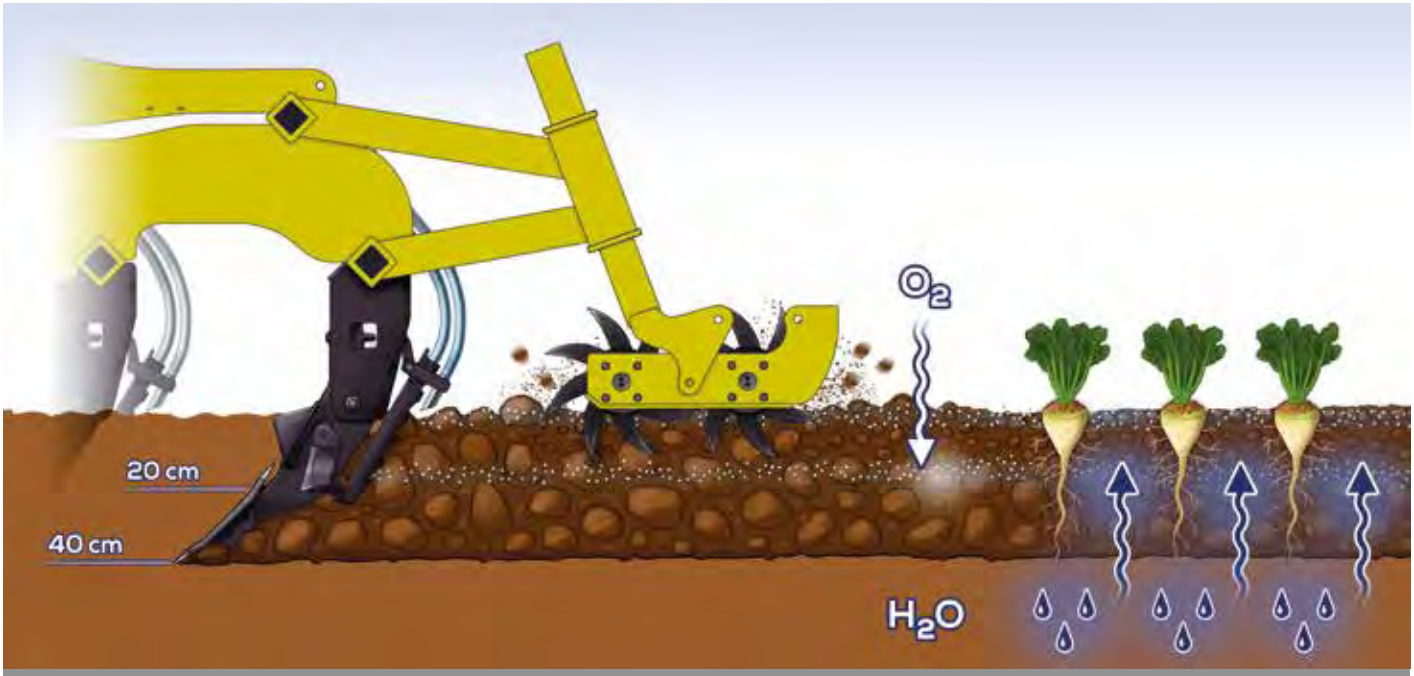
Inter-row cultivation of sunflowers

Chemical protection against weeds, needs to be understood (not only when growing sunflowers) as a solution with a certain risk status, and not as the only basic method.

Inter-row cultivation is a supplement to chemical protection especially in periods of drought, when the efficiency of pre--emergence herbicides is limited, as well as during occurrence of annual dicotyledonous weeds that are hard to eliminate with herbicides (flowering maple – Abutilon, cocklebur – Xanthium or Ambrosia), or in cases where herbicides are used with a limited spectrum of effects or a shorter action time.

As for sunflowers, use of a weeder depends on the condition of soil that should not be too wet, and weeds should be at an early stage of development. For inter-row cultivation of sunflowers, the most suitable stage is with 2 to 5 leaves, when a number of weeds, especially dicotyledonous weeds, have germinated from the soil.

AUTUMN PREPARATION – TERRALAND WITH FERTI-BOX STORAGE FERTILIZATION



Loosened and aerated soil helps the growth of sugar beet tuber significantly, and it can be obtained by a Terraland chisel plough that is able to work even in late autumn, in harsh weather conditions. To enhance accessibility of nutrients, it is recommended that in the autumn, storage fertilizer is applied directly to the soil profile using a Ferti-Box.

Direct root of the tuber reaches well into deep tilled soil. Tuber deformation starts – it is one of the main causes of soil blocking caused by insufficient loosening.

If the beet root has a sufficient supply of nutrients and good conditions for vegetation in loosened soil during the growth stage, it responds by turning pink fast. This indicates good sugar formation.

If the soil is prepared to depth in a proper manner in autumn using a Terraland chisel plough to a working depth of 35 – 50 cm, good conditions are established for a fast growth of the root, up to a depth of over 1.5 m. Such crops can take in nutrients very well, and continue growing even in a period of stress.

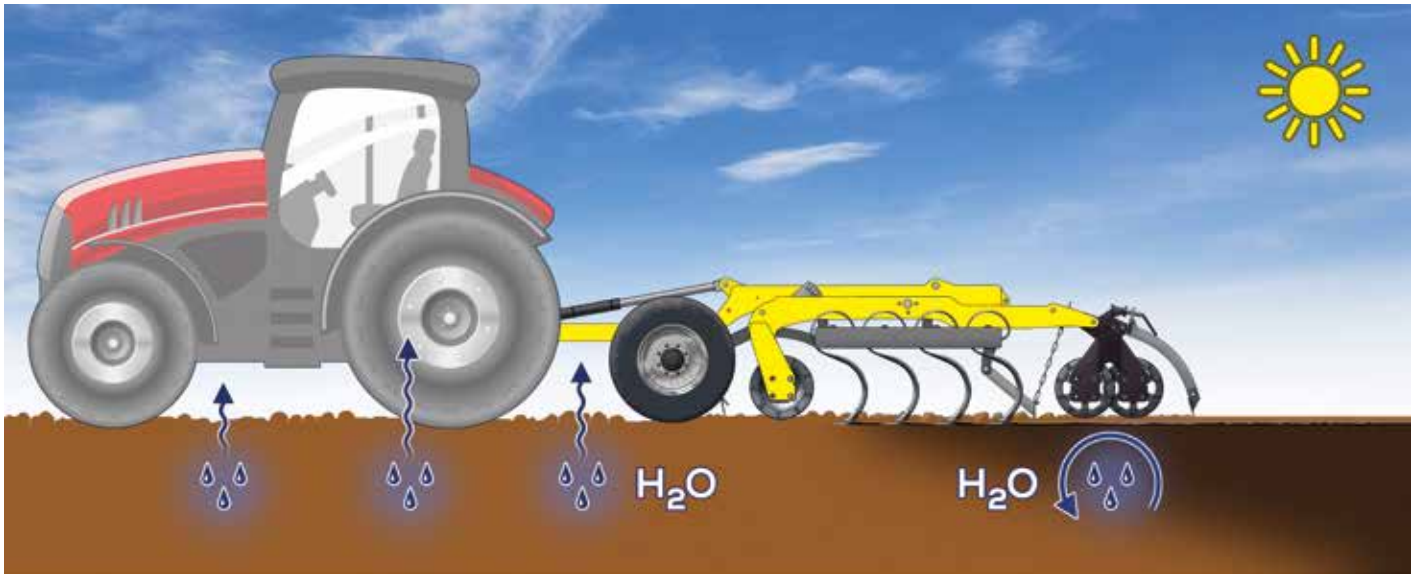
Beet technology

CULTIVATION DURING A VEGETATION PERIOD - ROW-MASTER

Care for sugar beet crop during a vegetation period plays a very important role and is part of the technology to achieve the required yield and high digestion of tubers. A BEDNAR ROW-MASTER inter-row cultivator with variable accessories cares for the crops in various soil conditions and at various stages of the beet growth.

AUTUMN – DEEP TILLAGE USING A TERRALAND WITH STORAGE FERTILIZATION FROM FERTI-BOX

SPRING – SPRING PRE-SOWING PREPARATION USING A SWIFTER WITH SB SHARES



VEGETATION PERIOD – INTER-ROW CULTIVATION USING A ROW-MASTER

RECOMMENDATIONS FOR INTER-ROW CULTIVATION

For a number of sugar beet crops, there is a delay in growth due to torrential rain and significant temperature fluctuations. Weed infestation also has a direct impact on the beet growth because the rows of the crop have not been sufficiently covered.

Inter-row cultivation brings about major improvement of the situation!

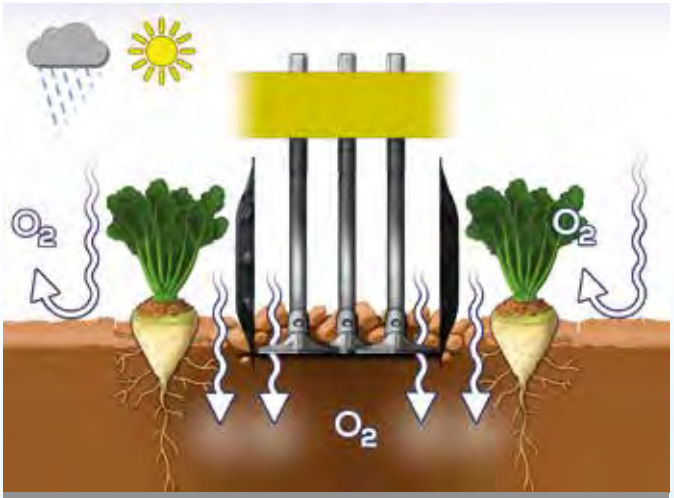
Effect of cultivation:

1. Crops of germinating beet usually do not have closed rows at that time and therefore we recommend inter-row cultivation. Loosening disrupts the soil structure and aerates the root system. This leads to a better intake of nutrients and thus enhanced growth of the tubers.

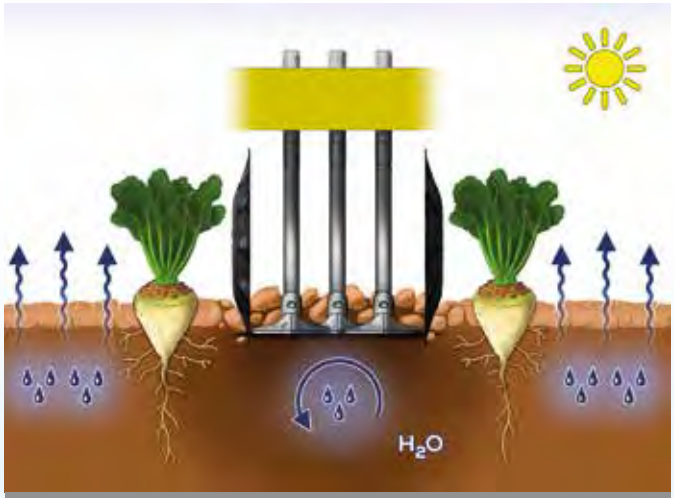
2. Another effect involves elimination of weed infestation. This regards particularly elimination of overgrown and partly damaged weed plants that have not been eliminated chemically with success. Although the weed plants are burnt, their retrovegetation often occurs in time, and they then overgrow the sugar beet and become its competitors.

3. Use of a weeder is important because it eliminates weedy beet in the inter-row space.

4. Inter-row cultivation is also important in a dry season. Cultivation interrupts capillarity and creates an insulation layer. This significantly reduces evaporation.



Access of air to roots – removal of the soil crust



Interruption of capillarity in rows means reduced evaporation in a dry season


Weed clearance


Elimination of weedy beet in the crop

ROW-MASTER RN_S SERIES

Inter-row cultivation of sugar beet

ZS Sloveč a. s.
district of Nymburk

Area: **3000 ha**
Machines: **ROW-MASTER RN 8100, Swifter SE 12000, Terraland TO 6000, Ferti-Box FB 3000.**

"We grow sugar beet on an area of ca. 400 ha. We have always used inter-row cultivation, as we consider this method of soil tillage very successful. Beet needs access of air which plays a major role also for the yield and digestion of the tubers. We needed to increase the output and therefore we have replaced our old cultivators with an 18-row Row-Master, with monitoring of the crop using the CultiCam optical system. This works great."

Ing. Ondřej Sobota, agronomist

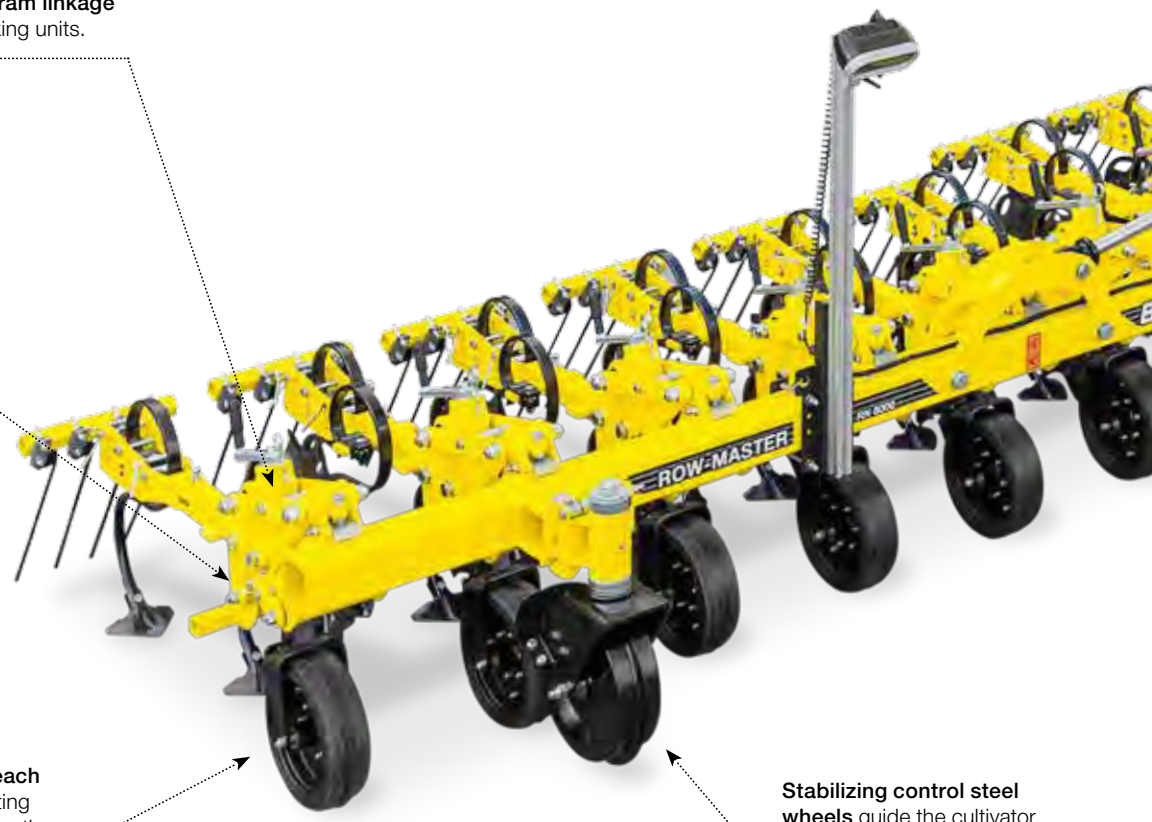
ROW-MASTER RN_S SERIES

Basic description

Self-guidance system with CultiCam, guides the cultivator to the rows.

Maintenance-free paralellogram linkage of the working units.

Increased down pressure of the working units thanks to the silentblock seating of the units.



Support wheels for each working unit with setting of the units´ working depth.

Stabilizing control steel wheels guide the cultivator through the crop.

STABILIZING CONTROL WHEELS

ROW-MASTER is equipped with stabilizing control steel wheels that guide the cultivator in such a way so that it maintains the direction of travel even at a higher speed and even in rough terrain.

ADJUSTABLE ROW WIDTH

The spacing between the individual working units can be changed easily by loosening the screws that connect the main frame of the machine with the working units.

ATTACHMENT TO A TRACTOR

ROW-MASTER inter-row cultivators are equipped with arms that can be shifted independently of each other. Each arm can be set depending on the type of the tractor, model and category of the 3-point hitch (I and III).

Hydraulic folding of the cultivator side frames.

Cultivator frame clearance of 42 cm.

3-point hitch, category II and III.

System of hydraulic movement of the cultivator responding to the information received from CultiCam.

ROW-MASTER		RN 2700 S	RN 4005 S	RN 5400 S	RN 8100 S
Number of rows	pcs	6	9	12	18
Working width	m	2,7	4	5,4	8,1
Working depth*	cm	2–10	2–10	2–10	2–10
Inter-row spacing	cm	45	45	45	45
Number of shares early cultivation (5 pcs unit)	pc	19	28	37	55
Number of shares and chisels	pc				
Number of shares and chisels for more demanding conditions	pc				
Number of discs	pcs	12	18	24	36
Total weight*	kg	760	1020	1580	2200
Recommended output*	HP	50–60	50–60	70–80	100–120

*depends on soil conditions

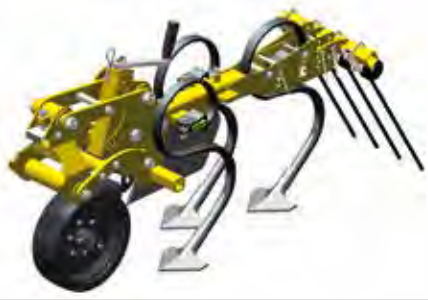
Description of the working units

Increased down pressure of the working units thanks to the unique silentblock seating of the units. The cultivator reaches the soil crust more easily and maintains the set working depth with more accuracy.

END WORKING SECTIONS FOR VARIOUS STAGES OF THE VEGETATION PERIOD AND SOIL CONDITIONS OF ROW-MASTER RN_S

WORKING SECTIONS WITH PLOUGHSHARES

For first early spring inter-row cultivation we recommend that you use 150 mm shares with 100% covering. The shares are affixed to flexi-tines. This first operation removes the soil crust and provides basic weed clearance of rows. Weeds are pulled out of the soil and soil is shaken out of the roots, which makes the weed wilt faster.



WORKING SECTIONS WITH CHISELS

For subsequent loosening, it is recommended that you use the working section with 1 share (150 mm) + 2 chisels (40 mm width). Chisels are mounted to flexi-tines. At a later growth stage, soil is usually harder, and therefore we recommend that you use 1 share plus 2 chisels instead of 3 shares. Soil is efficiently enriched with oxygen and it also retains moisture better.

WORKING SECTIONS WITH COVERING SHARES

As the final working operation, we recommend that you use a covering chisel (60 cm in width) with a mouldboard. Covering reduces the size of tops. This has a direct impact on the final assessment of tubers by the processor (sugar factory).

OTHER TECHNICAL ADVANTAGES OF INTER-ROW CULTIVATORS ROW-MASTER RN AND RN_S

MAINTENANCE-FREE PARALELLOGRAM SYSTEM OF UNITS

The paralellogram ensures precise guidance of shares, even if there are ruts after tractors, sprinklers, etc. on the land. Thanks to the paralellogram, movement due to terrain roughness is completely eliminated.

EASY SETTING OF THE WORKING DEPTH

The working depth of each of the units is set easily by means of a manual spindle mechanism (crank). The working depth can be set from 0 to 10 cm.

SUPPORT WHEELS OF THE WORKING UNITS

The diameter of the support wheels is 30 cm, the width is 10 cm. The wheels are steel wheels with a rubber surface. This ensures that soil does not stick to the wheels. ROW-MASTER can work even in very wet conditions.

FLEXI-TINE

Shares (chisels) work on flexi-tines made from spring steel. The flexi-tines allow movement in three directions "3D effect". Slight vibrations of the shanks ensure better throughput of the material between the shanks.

PROTECTIVE DISCS

Specially shaped protective discs of the working units define the cultivation width – protect leaves and roots. The discs also prevent the crop rows from being covered by soil and weed seeds. The position of the discs can be adjusted as necessary.

ADJUSTABLE TINE HARROW

Single-row tine harrows provide the final spreading and disruption of weeds in the row being cleared. At the same time, they level the soil surface behind the shares (chisels).

ROW-MASTER RN a RN_S

Self-guidance system

ROW-MASTER WITH THE SELF-GUIDANCE SYSTEM ENHANCES THE OUTPUT AND WORK PRECISION

BEDNAR ROW-MASTER can be equipped with the scanning optical system CultiCam to monitor the crops. CultiCam can navigate the machine as early as from the emergence of 2 genuine beet leaves which allows very early and precise cultivation. The CultiCam camera monitors 3 rows, assesses the crop, and then passes the information to the electronic system that communicates with the hydraulic control of the cultivator. It guides the Row-Master so as to ensure that the working units work accurately in the rows between the crop.

The height and angle of the camera can be set based on the current stage of the crop growth.

The CultiCam monitoring system includes a 7” monitor that passes information about the crop to the operator.

KEY ADVANTAGES OF CONTROL VIA THE CAMERA SYSTEM

- **Reduced risk of crop damage..**
- **Early spring loosening** as early as from the emergence of 2 genuine leaves..
- The machine can be set so as to ensure that it, **works very close to the rows with the crop** (accuracy +/- 2,5 cm).
- **Possibility of working at a higher working speed**, increased output.
- **Comfortable work without tiring the operator.**

Sensor of the current position of the machine frame in relation to the 3-point hitch.

The self-guidance system is able to guide a Row-Master even if crops are seeded in an arc.


JOY
OF FARMING

Product range

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The technical data and illustrations are approximate.
Reservations are made for any design changes.

TILLAGE

Straw harrows **STRIEGEL-PRO**

Disc cultivators **SWIFTERDISC**

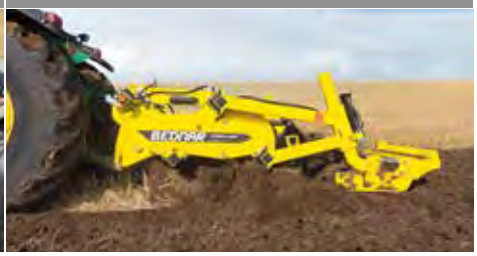
Disc cultivators **ATLAS**

TILLAGE

Seedbed cultivators **SWIFTER**

Versatile cultivators **FENIX**

Chisel ploughs **TERRALAND**



TILLAGE

Trailed packers
CUTTERPACK, PRESSPACK, GALAXY

INTER-ROW CULTIVATION

Inter-row cultivator **ROW-MASTER**

SOWING AND FERTILISING

Seed drills **OMEGA**

Fertliser hopper **FERTI-BOX**

ROTARY CUTTERS

Rotary cutters **MULCHER**

* K M *

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