

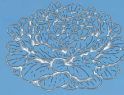
SPAPPERI



BROCHURE SA - IA

horticultural product range / soil care

The revolution in In-Row Weeding - fast, easy and reliable



Testimonials....

Each row unit replaces 10 manual workers!

Reduce my weeding costs up to 90%

Adjustable and optimizable speed based on crops

The system can learn new crops within a few hours

Working 24/7 – in every sun altitude

It works on crops at different stage of growth



**Ready-to-use artificial intelligence,
built to overcome every challenge.
Our technology adapts to any crop, soil,
and business need.**

**Maximum effectiveness everywhere, even on
the most difficult and weed-infested fields.**

**Dual solution with vertical rotary tillers
and horizontal fixed knives.**





No calibration required



No extensive setup required



Stit on your tractor and
weed in nearly any crop

**Weed removal and soil aeration
in a single pass,
with millimeter precision.**

**The SA-IA confirms itself as the ideal choice for those seeking
innovation, productivity, and maximum crop care
completely chemical-free.**

**built by Spapperi for the farmers
with proven results**

how it works?



1

Camera detects
the crop and
the flashlights
provide
consistent light
for best
recognition



2

AI sees multiple
pictures of
one plant and
calculates about
5-6 times if
it is a plant or
not



3

If it is a plant:
Knives or vertical tiller
open / keep opened



4

After the plant:
Knives or vertical tiller
close



5

The farmer is satisfied:
weeds are eliminated
and roots are aerated
to grow better.

TYPE OF WEEDING

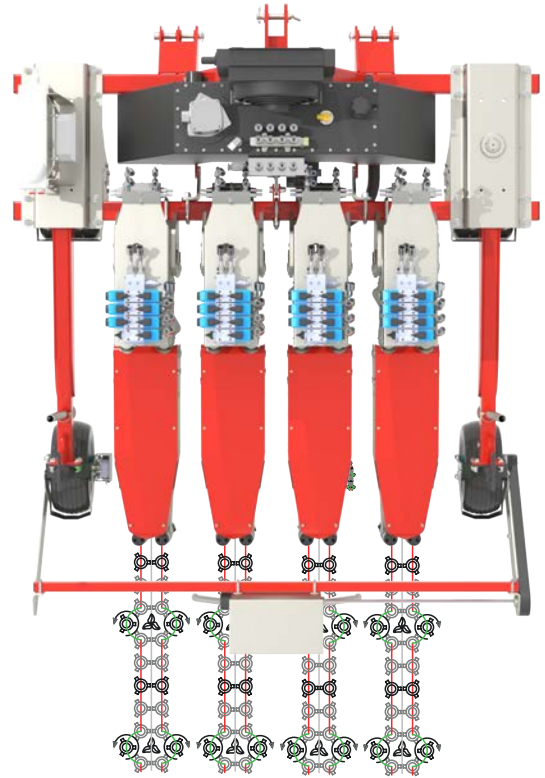
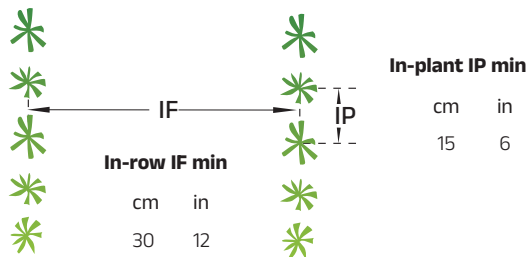


Weeding on open field



weeding on bed

LAYOUT PLANTING



REGULAR EQUIPMENT

- Frame and number of elements according to the setup.
- Dedicated and independent hydraulic circuit. Pump with PTO attachment, oil tank common for all elements
- AI-driven optical guidance controls the opening and closing of the rotary tillers, as well as the 3D hydraulic for featuring vertical shifting to adapt to the terrain and horizontal shifting for row alignment,
- **Tablet interface** for machine settings and movement configuration.
- **Excluding all required specifications and accessories** (weeding arms, vertical tiller, ecc)

Number of rows

1 - 4

Trasmission

Hydraulic
Pump with PTO attachment

In-plant - IP

Starting from 15 cm / 6 in

In-double row - IB

Starting from 60 cm / 25 in
Max value according to frame width

Sesto di impianto

Single row
Double row

Seduta operatore

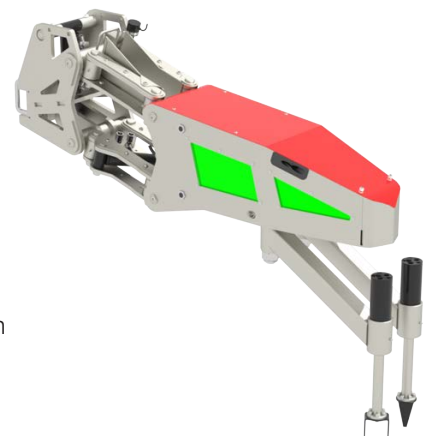
No operator on board

In-row - IF

Starting from 30 cm / 12 in
Max value according to frame width

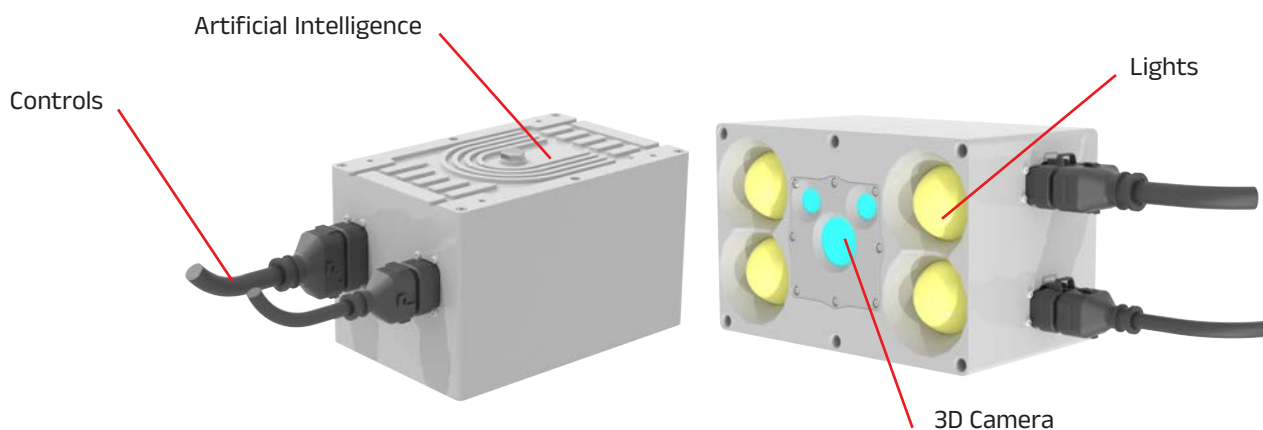
Estimated Productivity

4.500 - 8.500 plants/h per row
According to in-plant distance

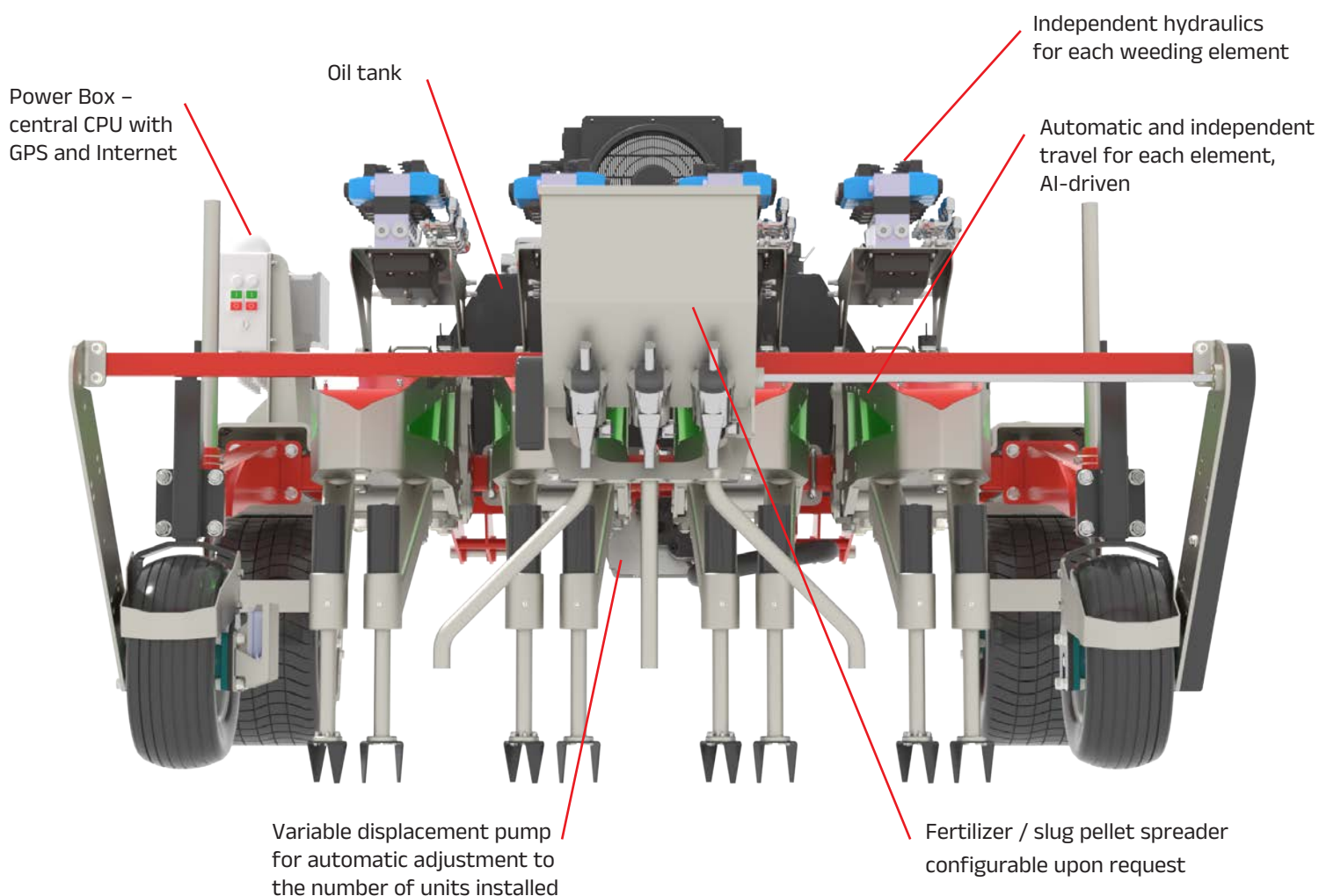


Key Elements of the Weeder

BOX AI - Ullmanna System



Hydraulic weeder



Element

3D parallelogram linkage for terrain adaptation and row alignment.

Adjustable opening/closing of the weeding arms for different crops and plant growth stages.

Anti-collision sensors

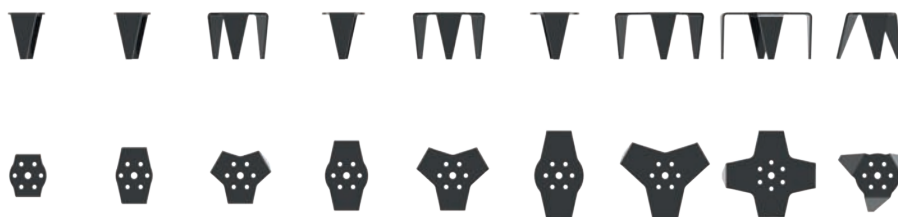
Box AI

Weeding arms:

- Continuous rotation vertical tillers with adjustable speed
- Horizontal fixed knives

REQUIRED SPECIFICATIONS

Weeding arms



Within the vertical rotary tiller kits, solutions with 2, 3, and 4 knives are available, with diameters ranging from 80 to 150 mm and working depths up to 75 mm. Custom solutions can be produced in request, subject to allowable torque limits.

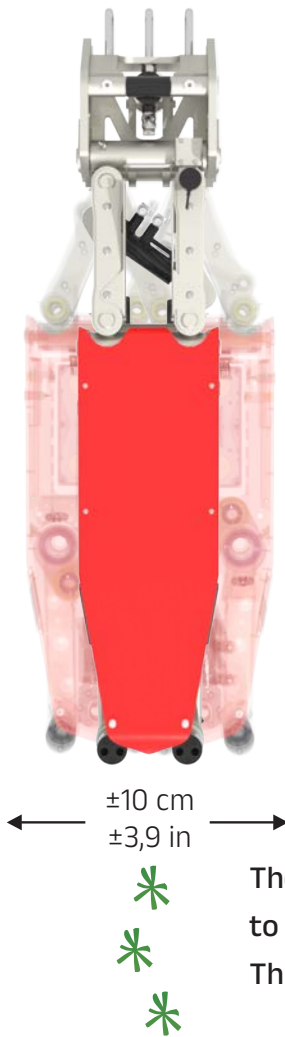
KIT ROTATION VERTICAL TILLER



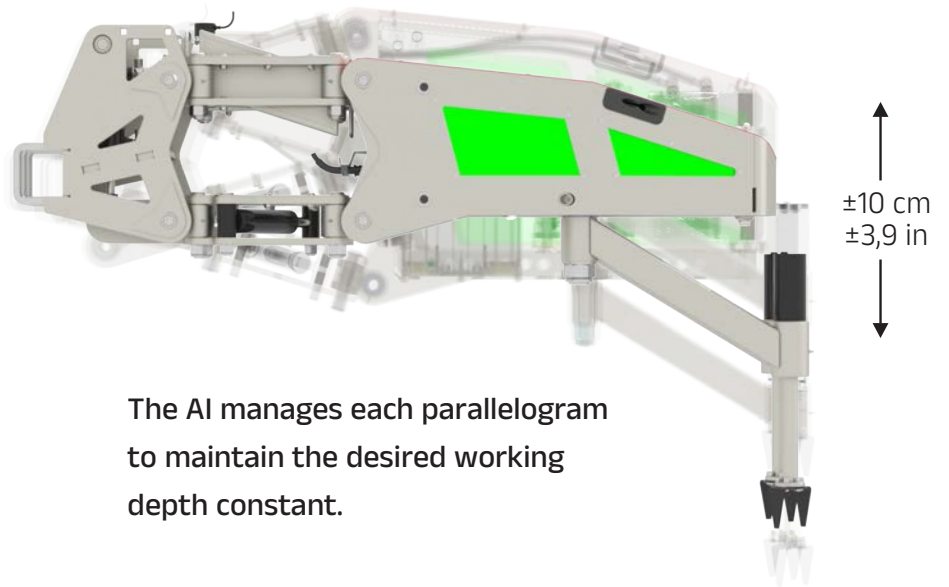
Within the horizontal fixed knife kits, various solutions are available. Custom knives can be produced in request.

KIT HORIZONTAL FIXED KNIVES

ROW ALIGNMENT



VERTICAL GROUND CONTOURING



The AI manages each parallelogram to maintain the desired working depth constant.

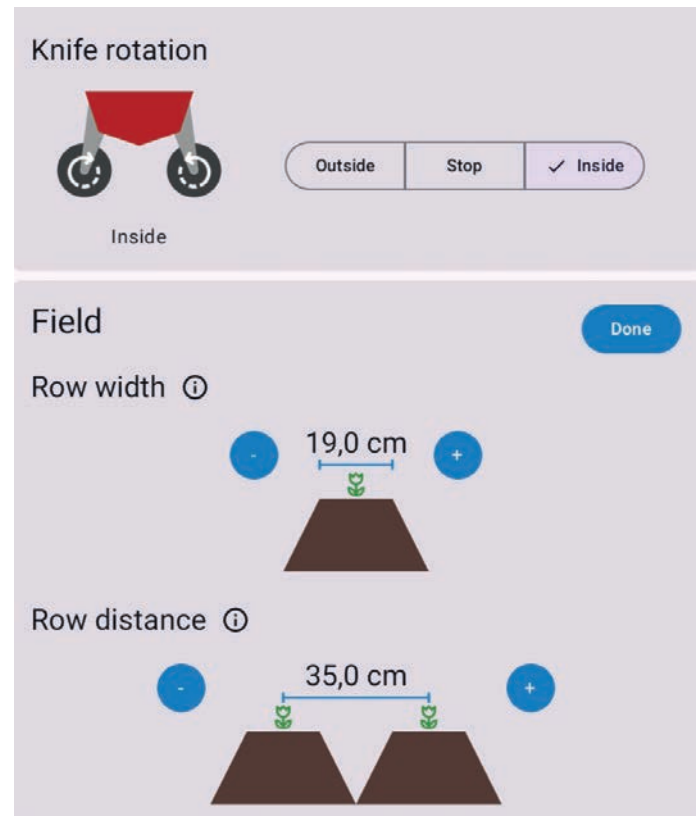
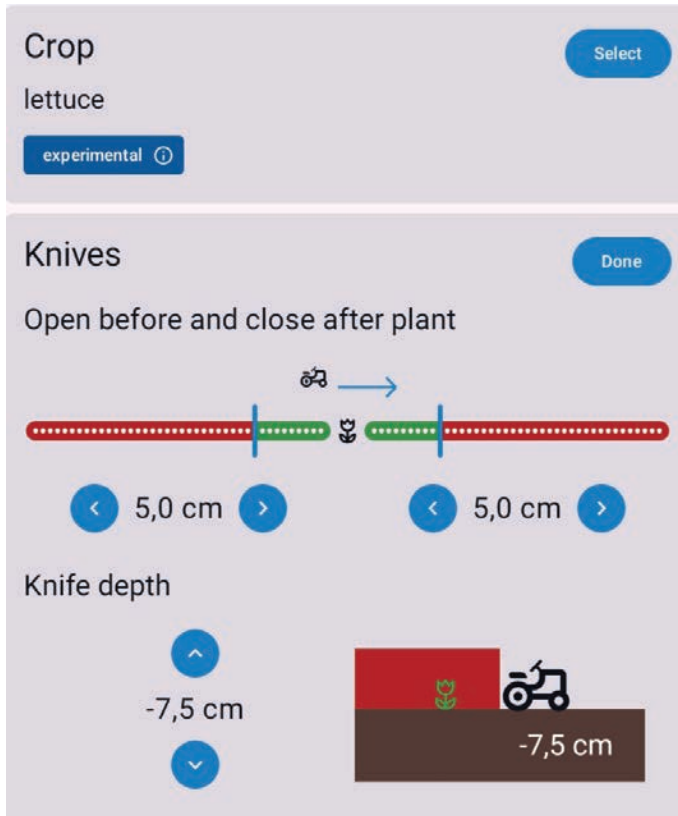
The AI detects the center of the plant and controls each parallelogram to optimize weeding proximity and prevent crop damage.

This also allows the system to compensate for any steering or transplanting errors.



SETUP

SA-AI is extremely simple to configure and can be easily controlled from any tablet or smartphone via a dedicated Android app. With just a few intuitive settings, the system is immediately ready for use, straightforward to understand, and accessible to everyone.



CHOOSE THE CROP:

Select the correct AI model for tilling.

OPEN BEFORE:

Select how many centimeters before the plant the tillers should open.

CLOSE AFTER

Select how many centimeters after the plant the tillers should close.

DEPTH:

Select your target working depth.

TILLER ROTATION:

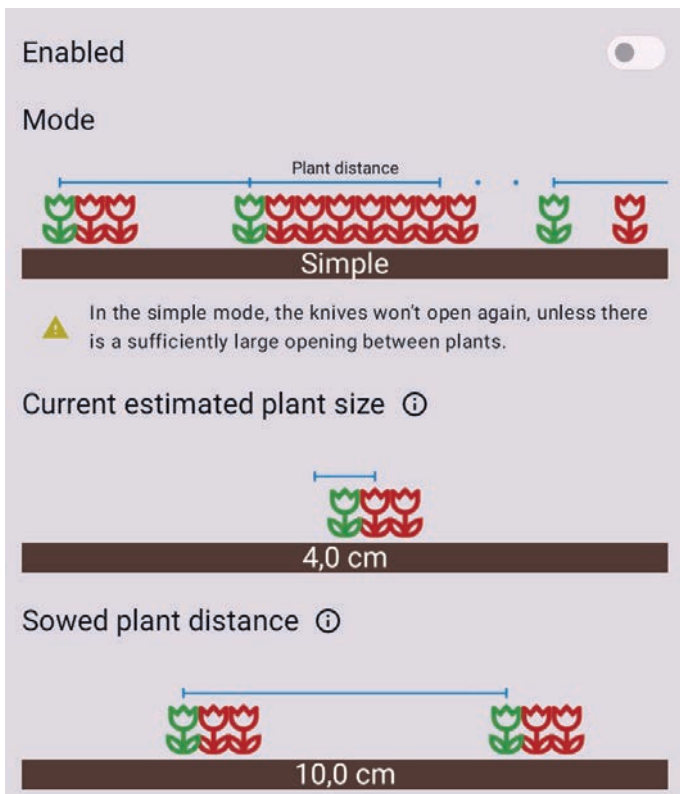
Select the rotation direction of the tillers.

ROW WIDTH:

Define the camera's viewing width to manage the correct working depth.

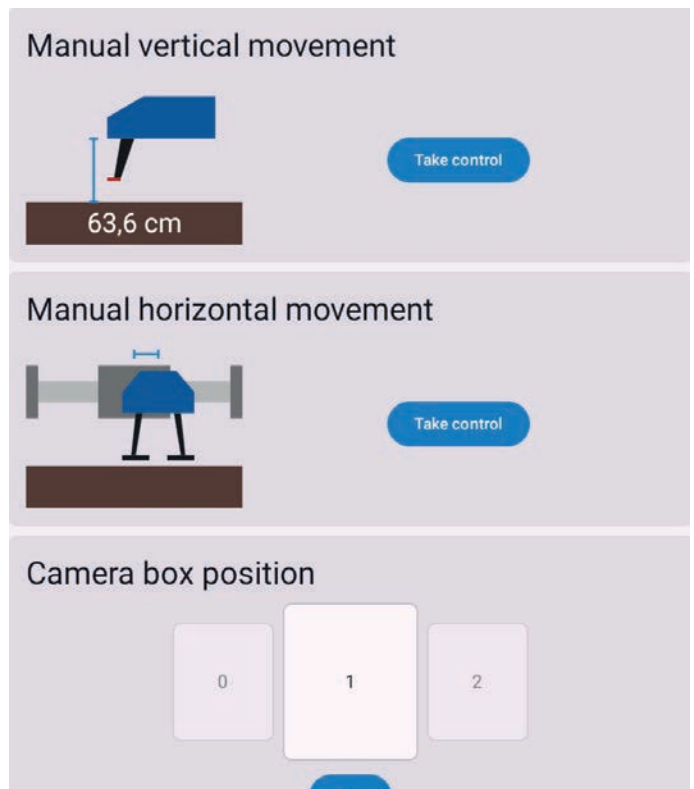
IN-ROW SPACING:

Define the distance between rows.



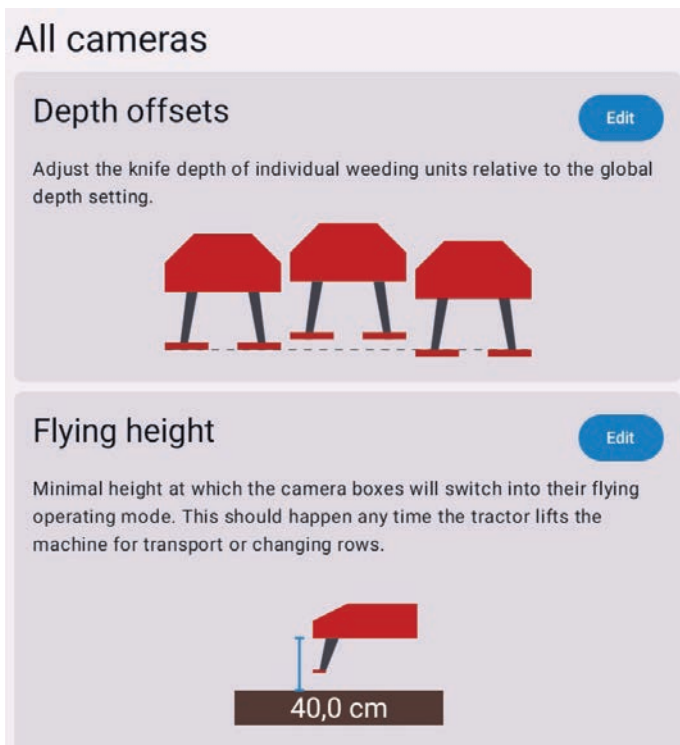
THINNING OPTION:

Select plant size and in-plant spacing; the knives will not open in order to perform thinning.



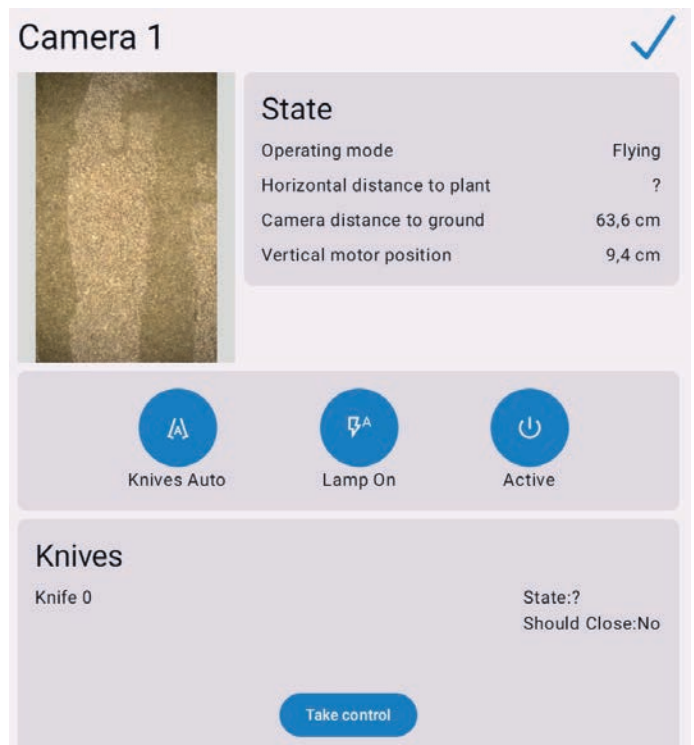
MANUAL MOVEMENTS:

Manually move each element during testing.



DEPTH MANAGEMENT & FLYING MODE:

Define depth variability relative to the general value and the switch threshold for flying mode.



OVERVIEW:

Monitor the settings of each weeding unit and view the live camera feed.



How does our system learn new crops?

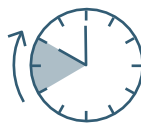
IT JUST TAKES ABOUT 6 HOURS



8:00
Machine drives
over the new
crop in FLYING MODE
and takes pictures



9:00
Automatic
upload
of picture



10:00
Tell the
system where
are crops



12:00
System
updates
model



14:00
Automatic Update!
The machine can
now work in the
new crop



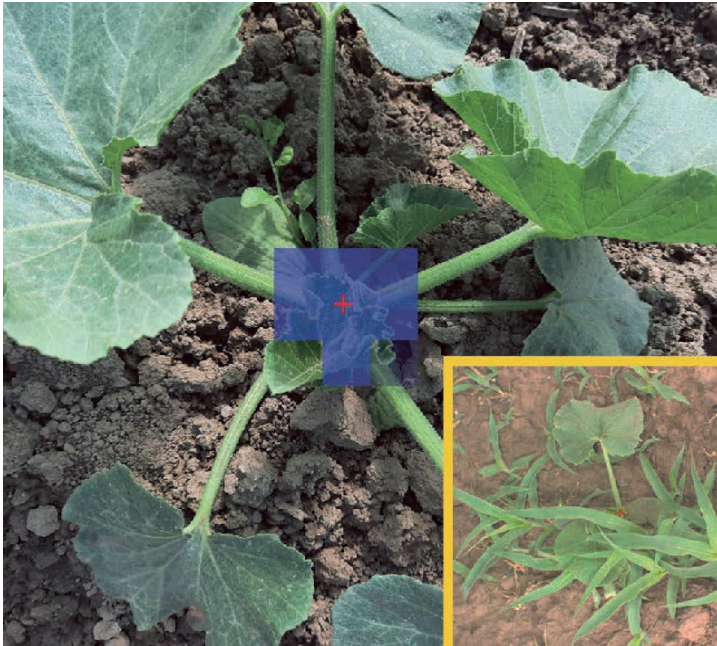
Connected ecosystem:

Every machine learns from every other machine, and the updates get always distributed via Internet.

Progressive effectiveness:

AI recognition gets better and better with every plant

Alcuni esempi di cosa vede l'intelligenza artificiale



Pumpkin

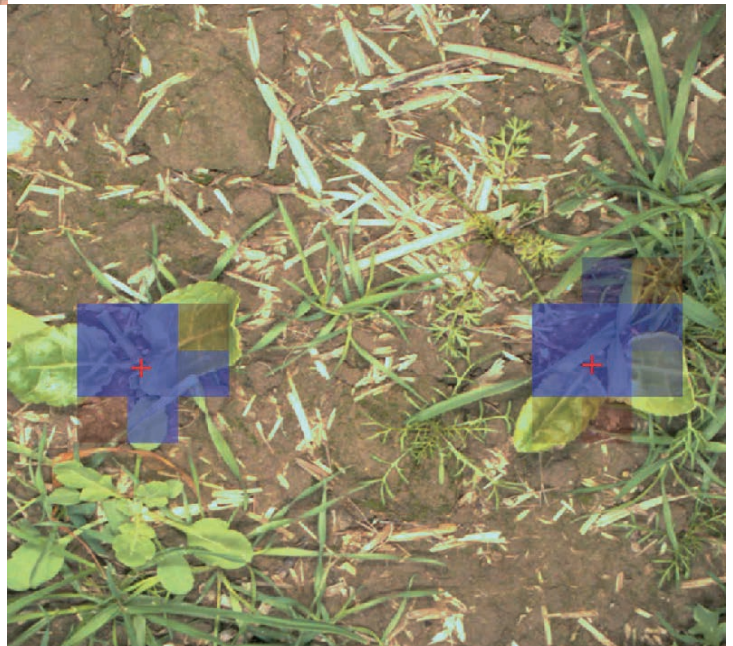


AI can accurately detect the center of pumpkin plants, even when they are overlapped, and is able to chop under the plant.

Sugar Beets



Accurate recognition of plants even on bad fields is no problem.



Cabbage



Due to crosswinds or growing paths, the roots and leaves of plants can become separated.

Our AI identifies the roots of plants (marked with +) and weeds around the blue area.



Boost productivity and cut costs with AI technology signed by Ullmann.

HERE IS WHAT WE OFFER...



99% Recognition of
plants within weeds



Cultivation possible
starting from
2 germinating leaves



Independent of crop,
in-row distance starting at
roughly 15 cm possible



More than thousands of
hectares already done



Side wind is not an issue -
we steer based on the root
part of the plant



Day or Night -
due to our lighting even
different sun angles
are no problem



No need for
any calibration



Every tractor driver
can work with SA-IA



High speeds increase
efficiency on the field



Works on nearly all crops



No ground
contamination -
no chemicals



Reduce my weeding
costs up to 90%



Nearly no manual
labor necessary!



Sustainable solution
for future growth





ORIGINAL EQUIPMENT MANUFACTURER

SPAPPERI

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