

garford

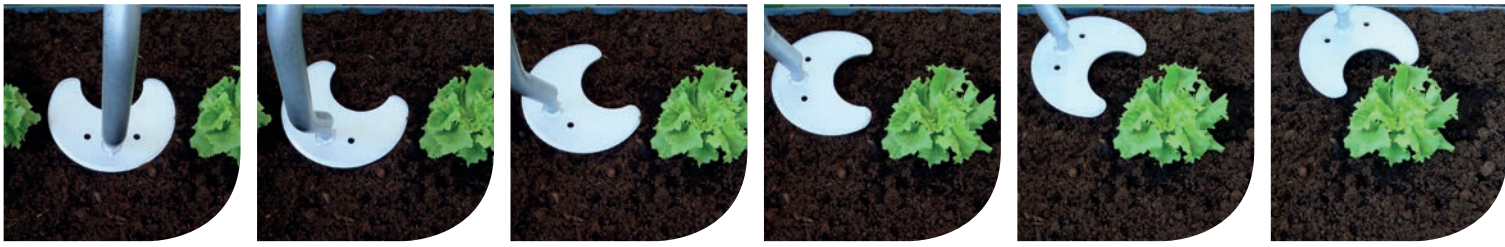
providing advanced technology for progressive farming



robocrop inrow

inter-row and inter-plant weeder

Robocrop InRow mechanically controls weeds growing between plants within



Overview: Robocrop InRow is based upon the same technology as the successful and well proven Robocrop inter-row precision guidance system. Robocrop InRow uses a digital video camera to capture images of the crop ahead of the toolbar. These images are analysed to find the positions of the individual plants as they pass through the image. This information is then utilised for lateral steering of the hoe and individual synchronisation of the InRow weeder discs. The Robocrop computer is constantly adjusting the rotational speed of the discs to suit the variability of plant spacing.

Inter-row and InRow Implement: Row following is maintained accurately to within 10mm, of average position of detected plant foliage, via steered soil engaging disc wheels. The working depth of the InRow weeder disc is controlled via the parallel linkage wheel unit.

Mechanical Design: The InRow weeder system uses a special shaped disc rotating about an axis and set to cultivate at a shallow depth (typically 10 to 20mm) within the crop row. The crescent shaped disc profile is designed to arc around the plants and then cut in between the plants as it rotates around the axis. Rotation of the disc is synchronised with forward movement and the plant positional information from the imaging camera.

The disc is coupled directly to a hydraulic motor which is driven via a proportional hydraulic valve controlled by the Robocrop computer.



rows of transplanted salads and leafy vegetables.



Disc profile and synchronisation setup is designed to maximise cultivated area and provide adequate tolerance to plant misalignment, in order to minimise crop damage. The tolerance required depends on the growth habit of the crop plants. For crops with regular growth habits the uncultivated area can be very small. 80mm D uncultivated plant zone is common.

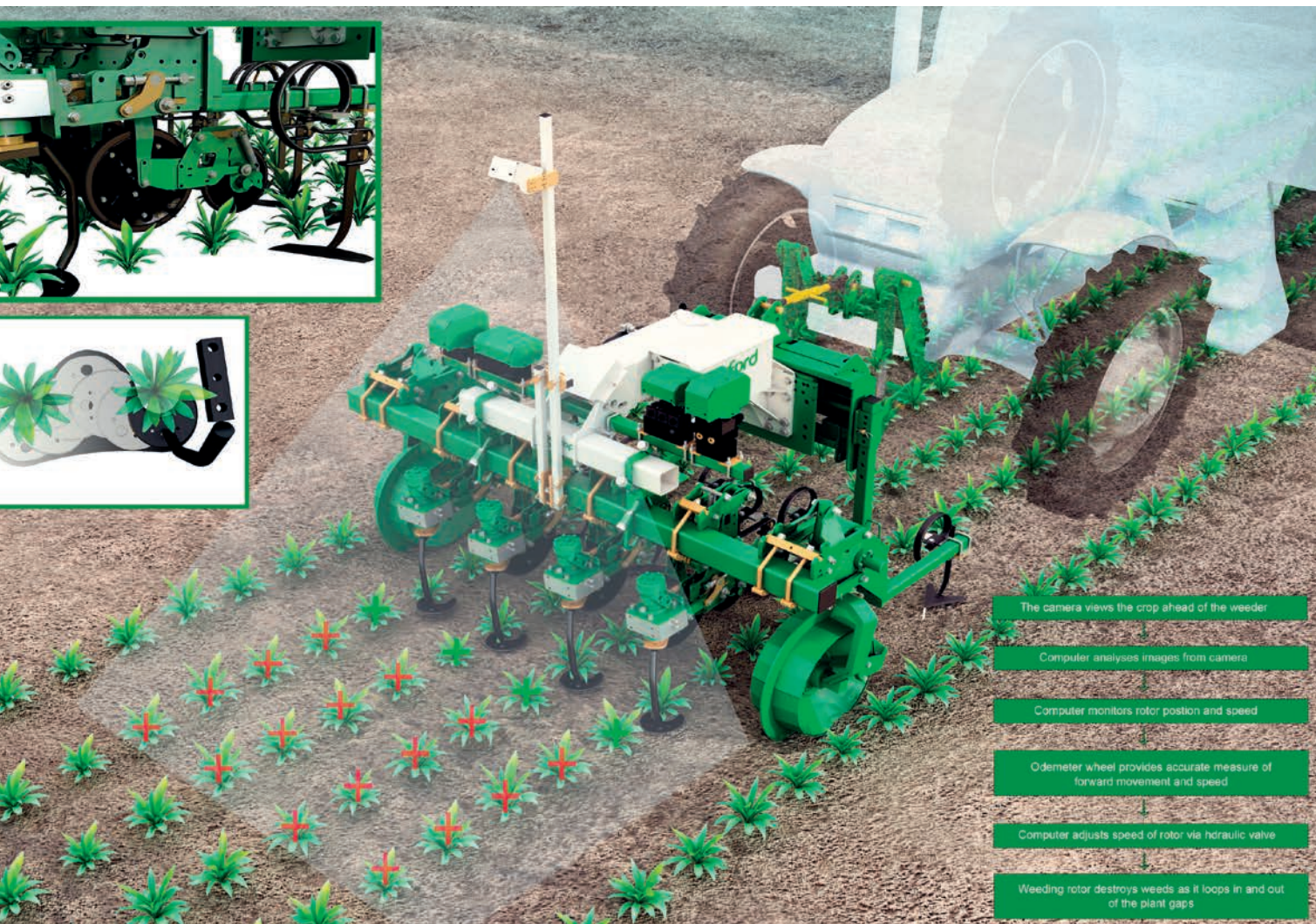
Performance: A performance of up to 4 plants per second per row is achievable. A 6mtr wide system in plant spacing of 50cm would travel at 7.2kph and achieve spot workrate of over 4.2ha per hour. The percentage of cultivated against uncultivated area can be better than 98%.

The 'film strip' above, shows the typical path taken by the weeding disc. The unweeded plant zone size can be adjusted via the computer to suit conditions.



Untreated

Treated



The camera views the crop ahead of the weeder

Computer analyses images from camera

Computer monitors rotor position and speed

Odometer wheel provides accurate measure of forward movement and speed

Computer adjusts speed of rotor via hydraulic valve

Weeding rotor destroys weeds as it loops in and out of the plant gaps

inter-row and inter-plant weeder



The InRow Rotors cultivate between the plants and conventional hoe tines complete the job inter row.



Robocrop InRow can continue to function even if some plants have grown into one another however for good reliable operation good plant separation is important



Robocrop InRow can be switched instantly between Green, Red and Infra-red colour modes.

Each camera can view a crop area of up to 2mtr wide. If wider working widths are to be accommodated then more cameras are mounted. Currently a maximum of 6mtrs is practical.

For reliable operation the crop must be the more dominant feature in the image. The crop must present more foliage than the weed material and that foliage should be closer in colour to the centre of the green colour band (540nm) or red colour band (620nm) when working in red mode.

Tractor requirements...

- 4wd of approximately 80HP for 2mtr 4 row, 100HP for 3 mtr 6 row and 150HP for 6mtr 12 row
- Category 2 front lift arms
- Closed circuit or load sensing hydraulic system with maximum of 12.5tr/minute per rotor.
- 12V electrical supply negative earth.
- Suitable wheel equipment for crop.



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