

## Selective Weeders

Agri-Technology Team

In this blog post, we will be looking at selective weeders. These devices can save on labor and reduce herbicide costs. Designed to be lightweight, these weeders can also help avoid soil compaction. Some weeders use RTK GPS technology to carefully weed between and within rows of crops, while others use machine learning to recognize and treat local weeds.

The first example is more than just a selective weeder. [Farmdroid FD20](#) is also an automated seeder and is able to handle more than 50 different types of row crops. This solar powered robot uses high precision RTK to give an accuracy of 8 mm when seeding. Due to this high accuracy, the device knows exactly which areas to clear and which to leave alone when it is weeding. The number of rows and row spacing can be adjusted and the field boundaries are programmed in so that it stays in the right area. For more detailed information and a demonstration, you can check out [this video](#).



Figure 1: Farmdroid FD20. Photo owned by [Farmdroid](#).

The next two devices we will look at use machine learning to recognize local weeds. The program is trained by using large databases of labelled images until it can reliably differentiate between weeds and crops. Cameras are then mounted on the devices and move autonomously around the field, seeking out and treating the targeted weeds.

The [Robot One](#), from [Pixelfarming Robotics](#) is an example of this kind of technology. The robot is first used to scan the field, preferably in different growth stages of the crop. The grower then labels the plants in their Pixel Farming Academy software, training the robot to seek out the weeds while leaving the crop alone. Once trained, this chemical free robot will move through the field and either mechanically remove the weeds or burn them with a laser. The tool heads for mechanical removal can be customized based on the crop and the wheel spacing can be adjusted. [This video](#) shows an overview of the process.



Figure 2: Robot One. Photo owned by [Pixelfarming Robotics](#).

Our final example also uses machine learning to recognize local weeds. Unlike the last two, this device is not fully autonomous. The [ARA](#) from [Ecorobotix](#) is pulled along by a tractor. Like Robot One, this device is trained to differentiate between the crop and local weeds. As it is pulled along, the cameras recognize the weeds and spray them with the appropriate herbicide at a high precision, cutting down on herbicide usage by up to 95%. A great feature of this product is it can also be used to precisely spray the crop plants with fungicide or insecticide. You can see it being used [here](#).



Figure 3: ARA selective sprayer. Photo owned by [Ecorobotix](#).

These weeders are yet another way machine learning and robotics is being applied to agriculture. While all three of our examples are used with row crops, new technologies are being developed all the time, making these kinds of devices more widely useful within the industry.

Sources:

[Pixelfarming Robotics - Robot One](#)

[Pixelfarming YouTube page](#)

[Farmdroid](#)

[Ecorobotix](#)

[Ecorobotix YouTube page](#)