Farmers Guardian

The UK's first robot from Danish company Farmdroid has been working in Shropshire for the past few months. Alex Heath went to see it in action.

Quietly pacing up and down a field of stubble turnips in a secluded part of north Shropshire, the country's first Farmdroid FD20 is busy at work, autonomously caring for the crop it planted earlier in the year.

Imported into the UK by Chris Brettell and brother Ed of F. S. Brettell and Sons, the Farmdroid is a Danish invention, that promises to be provide carbon neutral farming methods.

Chris Brettell says: "I was power harrowing a field ahead of beet planting this year, and thought there must be a less intensive way of planting and providing crop care throughout the year."

The farming business extends to 485 hectares of organically farmed land around the base near Hadnall, Shropshire. As a result, weeds are the farm's biggest issue and a perennial problem is how to control them, especially in beet land. Fat hen tends to be the biggest problem, reports Mr Brettell.

The farm has used interrow harrows and a Garford machine in the past, but all these methods rely on the plant having emerged and grown to a decent size before they are effective, giving weeds an opportunity to get up and away. Que the arrival of the robot that uses software and gps to mark the exact location of each planted seed.

Arriving on the farm earlier this year, the Farmdroid FD20 is an autonomous planting and weeding machine that will tend to the crop throughout the year.

Mr Brettell says anything that is prilled or of an even shape and round shape can be drilled, opening opportunities to drill beet, OSR, onions and a multitude of other species with it.

Arriving after the beet planting season had finished, its first job was to plant a crop of stubble turnips.

The key to accuracy is the design of the seeding unit, which meters seed individually, before dropping them down to a seed holder that keeps them just above the soil before releasing them exactly where they need to be placed, forming a grid like pattern across the field.

"Which ever direction you look, there are lines of crop," reports Mr Brettell. "Because it accurately places the seed, even before the seed has germinated, the robot knows where to weed, and it is accurate to 5mm, using an RTK signal for positioning."

The 900kg machine is available in a working width of three metres, and has options of row spacings from 225mm to 750mm. Mr Brettell currently has his FD20 set on 500mm rows, meaning 12 tools are used for weeding and six units for seeding. Once seeding is completed, the tools are moved across by half the row width for weeding.

Inter and intra row weeding is possible, with a knife engaging in and out of the crop rows to kill weeds growing and wire shares running between the rows. The principle is to make frequent passes, constantly disturbing any new growth, by only moving the top few millimetres of the soil profile. In doing so, water infiltration is also enhanced.

The machine is fully electric and does not require any charging. Instead, solar panels on the top of it charge four batteries, delivering up to 1.6 kWh, equivalent to 20 kWh a day. Mr

Brettell says: “in summer, the robot will run for 24 hours a day, while in October with shorter days, it will work for 18-20 hours before it runs out. Come morning a little light and it is up and running again.”

Two motors on the rear wheels provide the propulsion and single wheel on the front is for turning.

The manufacturer suggests one robot is sufficient to look after 20ha, depending on the crop. Mr Brettell reports work rates of more than 4ha in a 24 hour period.

It has a maximum speed of 950m/hr. “When it was seeding, we saw working speeds of 450-550m/hr,” Mr Brettell says. “When its hoeing, this increases to 600-700m/hr, depending on the conditions and how aggressively we set it. It might not sound fast, but its out doing the job on its own and allows us to do other jobs, while the hoeing and seeding is being carried out.

“Any deviations from the set parameters and it will notify me through the app. It has a camera that shows me what it is doing, so I can adjust anything on the machine remotely.

“Setting the field up involves mapping out the boundaries and any obstacles. A trip wire around the machine ensures if it comes into contact with anything, it stops.”

In addition, a rain sensor on the top stops the machine if the precipitation becomes to hard.

Having seen the machine in operation for the past few months and happy with the job it is doing, Mr Brettell has now become a dealer for the robots and sees a bright future for the technology in the UK.

“There is such a variety of crops that can be grown and tended to with the robot. It works for us because we cannot use herbicides, but for salad and veg producer that have typically relied on labour for weeding, it is an interesting proposition. The owner or farm manager still has total discretion over what and when the robot is doing, and can select row distances, frequency of weeding and a multitude of other factors to suit their system.”