

Chelmsford Monitor Farm

Meeting title: Robots and autonomous vehicles

Date: 13 December 2019

Speakers: Sam Watson-Jones (Small Robot Company) and Tony Saunders (JSD Rail)



Robots of the future Sam Watson-Jones, Small Robot Company

- Future vision: A farmer will know the exact location of each individual seed, can monitor its progress through the year and harvest the individual plant. This will then enable a move away from monocultures, a move towards multiple species in a field, larger use of pollinators and environmental schemes in a field and more.
- The countryside today has been designed for the machinery that we have today – driven by making the machinery we use as efficient as possible.
- “We are on the cusp of huge change” – the third agricultural revolution has now exhausted itself. The fourth includes the use of artificial intelligence, which is the bit that is going to change farming. AI has the power to put research into practice and take learning from one farm for the application on another, nationally and internationally.
- Small Robot Company have a family of robots:
 - Wilma – data analysis and decision engine
 - Tom – monitoring robot, mapping and monitoring per plant
 - Dick – non-chemical weeding (electric weeding)
 - Harry – precision planting
- The company are taking existing technologies and applying it to the new robot model, eg. use of Wrootwave – currently used as a handheld electric weeding device.
- The future business model is looking at: per hectare, end-to-end service



Chelmsford Monitor Farm Group's Future wishlist for robots and precision technology:

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| - In control of future – PPP's | - Security – hacking? |
| - Weed control – non-chemical | - Improved soil structure – reduction in weight |
| - Better/safer industry – attracting people/perceptions | - Increased accuracy – 24/7 work; drone; data analysis |
| - Work less/more efficiently – less fossil fuels; less environmental impact | - A.I. – ability to spot weeds/diseases; observation |

- Long-life robots
- Complete grain storage – automated
- Taking subjectivity out of decisions
- Smaller machines
- Efficient use of nutrients
- Understanding of data – retention of control over decision making
- Recording accuracy
- Electric fencing movement

Precision technology in practice Tony Saunders, JSD Rail

- JSD are a weed control and engineering company specialising in rail. They manage Network Rail's national contract and run 6 trains.
- Network Rail has 21,000 miles of track and lineside!
- Their spray trains work at 30mph or lower
- A 5 hour shift covers 100 miles of track
- They have different areas on the track to spray/consider and no spray sites that require different treatments
- Use of the radiarc spray heads has made a massive difference – can now spray at 30mph at 200l/ha
- Nozzles are at 25cm spacing and the technology is reading at 40,000 times a second.
- The use of spot spraying through the WEED-IT technology has reduced 95% of chemical cost in an arable situation in Australia and reduced water need; 70% reduction of glyphosate in a rail environment and helps compliance with the Sustainable Use Directive.



Further information

- Research Review: [Weed control options and future opportunities for UK crops](#)
- PhD project: [Variable rate application of plant protection products - investigations to establish the feasibility and potential cost benefits \(2140012101\)](#)
- [Farmbench](#)
- [SmartHort](#)

AHDB resources

- Understand your business costs with AHDB's benchmarking tool Farmbench at ahdb.org.uk/farmbench
- Monitoring tools are available at ahdb.org.uk/tools
- Sign up to market information and research newsletters at ahdb.org.uk/keeping-in-touch
- Find out what's going on at other Monitor Farms and Strategic Farms at ahdb.org.uk/farm-excellence
- All AHDB events can be found at ahdb.org.uk/events
- For guidance on how Brexit will impact your business, see ahdb.org.uk/brexit

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