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DIGITALISED WEED CONTROL IN SWITZERLAND

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Living Lab
Weed control in Swiss organic vegetable growing
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Robots, GPS, cameras, sensors, smartphone, tablet
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The Swiss organic vegetable production is increasingly affected by the on-going digitalisation of society as a whole. In the frame of the EU DESIRA project, the Swiss Research Institute of Organic Agriculture (FiBL) is facilitating a Living Lab involving stakeholders around the following question: "**How can weeds in Swiss organic vegetable production be controlled effectively and efficiently?**"

In organic farming, weeds are usually controlled mechanically and by hand, but digitalisation may bring substantial changes as it allows automation. Fully automatic systems for weed management are not yet used in Swiss vegetable production, apart from a few pioneers and at experimental level. Weeding robots are currently in a testing phase. In practice, semi-autonomous hoeing modules (pulled by tractors) are widespread.

The impacts of using digital tools for weed management are diverse. It reduces the need for manual work (and associated costs) and possibly improves working conditions and increases labour productivity. However, farmers are becoming more dependent on technologies, tech companies and advisory services. In addition, the entry and maintenance costs are high and the cost of the technology is limiting their adoption and increasing disparity between larger and smaller farms. One practical way to reduce these costs, though, is to develop sharing systems among farmers.

Another possible challenge is the time needed for farmers to parameterise and use digital tools. This is especially relevant in vegetable growing where the work is generally tightly scheduled due to the high variety of crops to be dealt with. At the same time, the use of GPS-controlled guidance systems can save time when the user has the required skills as they allow areas to be mapped and thus managed more efficiently. Despite the current shortage of skilled workers, digital technologies could attract new skilled

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workers in agriculture. The time saved is not reflected in the form of increased free time, but in shifting the freed-up working time to other areas.

Moreover, fully autonomous robots are not yet well adapted to the Swiss conditions. Such robots should be able to deal with (even slight) slopes, heterogeneous soils as well as changes in the weather in order to enable 24-hours operation and to reduce technical failures.

Having said that, more and more digital tools are being used in Swiss organic vegetable growing, especially in the areas of administration, organisation and communication. The advanced test series on weed control suggest that relevant digital technologies will soon be ready for large-scale use in that area.