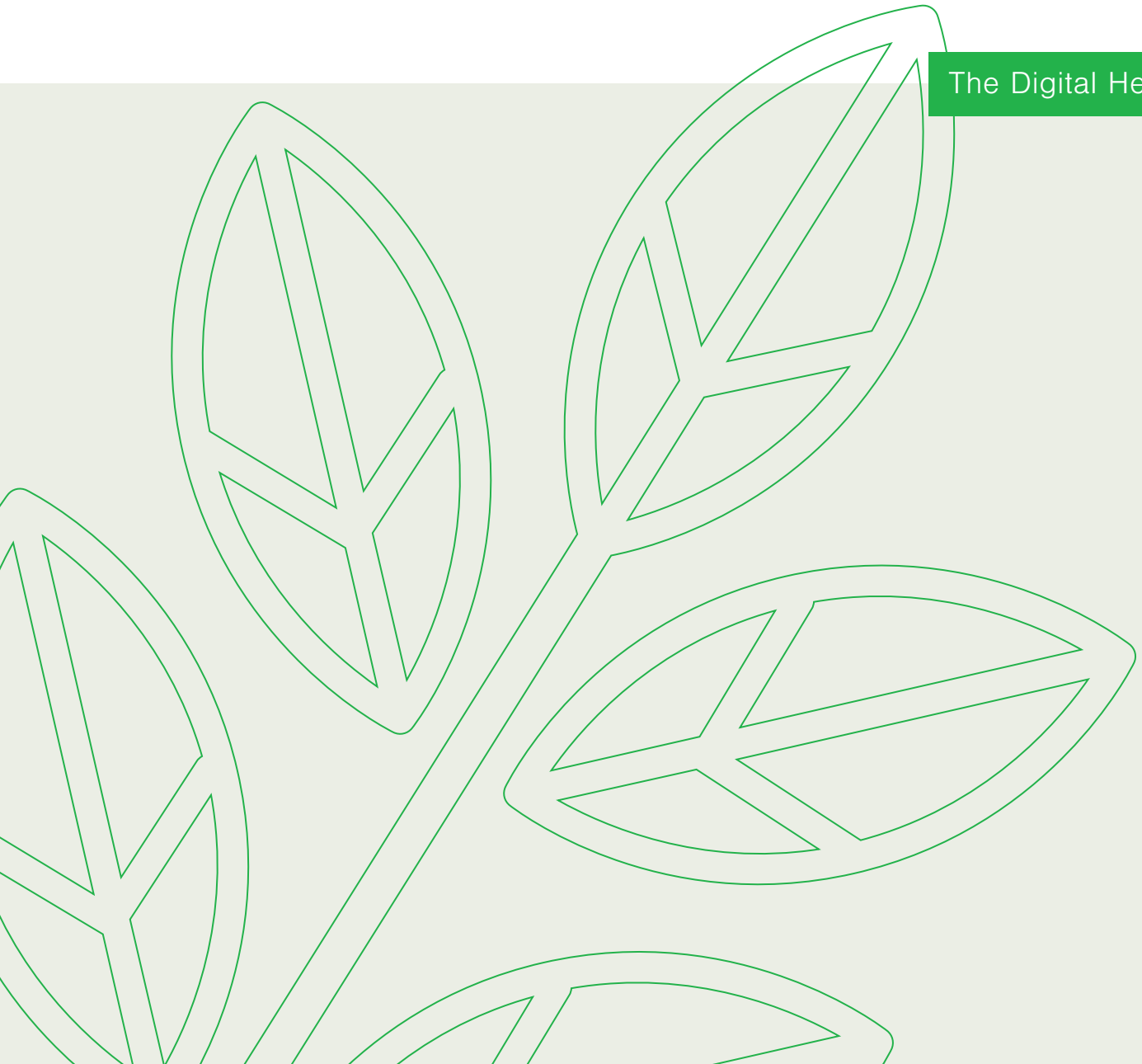
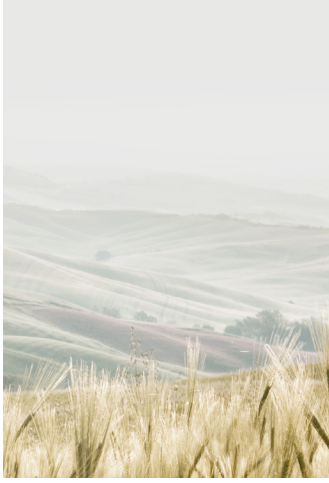
zasso GROUP

Reversion to Ploughing is not an Alternative

It is possible to look out with optimism
to the great challenges in agriculture

The Digital Herbicide





The development of sustainable technologies for weed control is well on track – to support an agricultural system that uses less chemical herbicides.

"Swords to ploughshares" was a slogan that still envisioned the plough as a peaceful alternative and reliable a basis for food production. But this image has changed considerably. Although the first proponents of no-till soil management recognised more than 100 years ago that churning up the soil destroys essential ecosystems in the long run, it was only the widespread use of Glyphosate that made this method a worldwide success, because the chemical herbicide allows control of obstinate weeds without the high energy input of ploughing. The carry-over of fungal diseases through re-germination of volunteer grain ("green bridge") can be inhibited or the spread of nematodes after a rape seed harvest minimised by just one application of Glyphosate, without disturbing the soil or deeper tillage. The risk of erosion through water and wind decreased, which was decisive for many growing regions around the globe. As a result, the numbers of earthworms and other soil organisms increased significantly. Suddenly the soil was demonstrably able to retain so much additional carbon (while at the same time storing more water) that no-till farmers could become sellers of CO_2 certificates. Even with a diminishing rural population still working in the fields, ever larger areas could be cultivated and gain good yields. Farmers everywhere soon converted to soil conservation approaches and created entirely new agroecosystems, with distinct social and economic implications. Some areas of the purely conventional agriculture apply Glyphosate even too a much greater extent than no-till farmers, also decreasing their energy consumption and workload.

However, the side-effects of the Glyphosate triumph are becoming increasingly obvious. Aside from the dangers for the health and environment and the creation of resistant plants, microorganisms in the soil, insects as well as birds are also directly or indirectly affected by the broad, often extensive and extremely efficient use of the chemical. Not all effects can be directly and causally retraced, but knowledge about interrelations is steadily increasing. The implementation of the precautionary principle prevalent in Europe also calls for restrictions, and these currently get off the ground.

An overview of all arguments against a reduction or abolition of Glyphosate show several important aspects:

1. Glyphosate has shaped agriculture, the environment and social structures to a considerable extent.
2. The dependency on its application is therefore large. The same also applies to the risk of damage in case no adequate substitute becomes available in time, before a foreseeable phasing out of further application areas or in the case of inevitable restrictions on short notice.

Farmers therefore need to be offered a practical, technical alternative when it comes to weed control, and most of all one where no soil movement is involved! Otherwise, a change will generate increased and substantial CO_2- as well as nutrient releases – and this effect already happens during the first ploughing. In addition, the ecosystems that

have been established over so many years will again be destroyed. It is not surprising that pasture tilling is strictly regulated by the EU. In addition, the status quo regarding manpower, erosion, soil compaction and bonus systems for careful tillage cannot easily be changed.

Turning exclusively to organic farming (which also partly uses tilling to large extent) with totally different agroecosystems and cultivation methods is also no option. This approach cannot be transferred to the necessary scale and is not at all a short-term alternative for all regions. Moreover, many organic farmers know the limitations of their weed control methods only too well and they are increasingly looking for new options.

But no other chemical herbicides will be forthcoming. The chemical industry has been searching for more than 25 years now. An extended use of already existing chemical herbicides is also no solution. It is with good reason that their application is becoming more and more restricted, with increasing knowledge about their side effects and the possibility of accumulation in the human body and the environment. The only reason that Glyphosate is the most common herbicide today is that there are no more recent, cheaper and more efficient replacements. It has become more of a victim to its own application success, as a herbicide without alternatives and a publicised low toxicity, than to the increasingly obvious health and environmental impacts. Yet while these rather complex and indirect side-effects have remained obscure for a long time, this makes them no less relevant.

Consequently, the challenge is a great one when the focus is now on restricting Glyphosate as well as other problematic herbicides. No matter what chemical molecules have been taken off the market in past decades: in each case, a very successful and economically relevant product needed to be replaced by an even better, technologically more advanced one. For example, the case of replacing PCBs and CFCs initially demanded various extensive innovations before the environment could actually start to benefit. Every time an increase in intelligent technology and a decrease of residue where the main goals stated.

These complex problems can only be approached in a concrete way and to a degree acceptable to individual farmers as well as society, by reinforcing the social and economic structures in agriculture, lowering the overall energy consumption, using soil for carbon storage, reducing the impact on the environment and strengthening sustainability.

Many of the required building blocks have already been developed, and innovation would at least gain a decisive boost if a change were projected. Wider awareness of alternatives, which now have to be extensively studied, tested and put into practice, forms a core element of a forward-looking, sustainable agriculture.

Europe already has many marketable methods for weed control in cities and fields, using such innovative techniques as high voltage, pressurised water, hot water, highly biodegradable nature-like substances, sensor-controlled hoes and brush systems. Instead of monopolies and monocultures, diversity is key for the companies. What all of these mostly medium-sized enterprises have in common is a large potential to prove, in a flexible way and on short notice, how and where chemical herbicides can be replaced by innovative technologies – while also addressing currently unsolved issues (resistances, lack of confidence in the public opinion, image loss).

It is definitely wrong to claim that Glyphosate is without alternatives and its abolition will lead to considerable losses and damages, for there are already alternative concepts in place – for the sustainable control of spontaneous vegetation that crosses the threshold to becoming damaging and therefore a weed.

Apart from the already applied mechanical methods on the soil surface, Zasso proposes the electrophysical treatment with high voltage currents. This technique offers an opportunity of controlling and treating the vegetation systemically, right down into the roots, with an effect similar to that of Glyphosate, but without moving the soil. The high voltage is conducted through the plants and specifically damages their water supply in the shoots and roots. Only plants touched directly by the applicators are going to dry out afterwards, and all without any chemical residues. The soil is not moved, erosion avoided and the habitat of the soil organisms remains totally intact. This efficient method can be used as well to treat weeds on paving, gravel, water-bound coverings and streets.

Depending on the area of application, other innovative methods can also prove to be effective. And ultimately a combination of methods is going to keep spontaneous vegetation in check wherever it definitely causes damage and becomes a weed. This demands a more precise, selective weed control approach – to protect the environment in all those locations where vegetation is more valuable for animals and plants when it remains in place than when it is removed.

Electroherb
The digital hebicide

The ecological, clean technology

In summary, it is possible to look out with optimism to the great challenges in agriculture. And while there may be no chemical replacements for Glyphosate, there will be numerous physical alternatives for weed control. Many of these innovative techniques are currently developed or already deployed in Europe. Now the task is for all parties concerned to work together in identifying the best alternatives for individual agricultures and regions and to implement them straight away. Only then can the health and economic risks for farmers, the environment and our society overall be kept within limits – for a future-oriented, strong agricultural sector.

To learn more about Electroherb, please do not hesitate to contact:

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