Inspirational ideas

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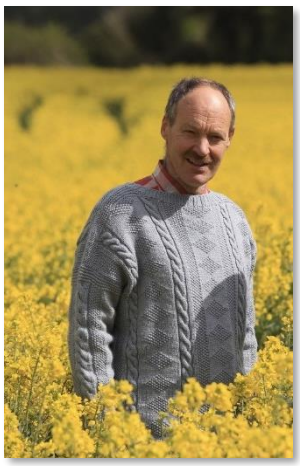
Weed control without chemicals

Ben Colchester is an organic farmer in County Kilkenny, Ireland, working to protect the soil and environment and provide healthy products to his customers. He was selected as an expert in the EIP-AGRI Focus Group on non-chemical weed control.

Over the past decades, agriculture has become increasingly dependent on the use of herbicides and of pesticides. While they have contributed to boosting yields, herbicides can have negative effects on the environment, on biodiversity and also on human health. Therefore, the EU has more recently created policies which seek non-chemical weed management techniques which can reduce the impact of herbicides on environment and human health while at the same time safeguarding the competitiveness of agriculture in the EU. These techniques include crop rotation, mechanical weed control, use of alternatives to critical active substances.

Between 2018 and 2019, the 20 experts (farmers, advisers, researchers…) from different geographic regions of Europe worked together within an EIP-AGRI Focus Group to discuss the challenges and opportunities for the implementation of non-chemical weed management practices in arable cropping systems in the EU. The results of their work have been presented in their final report, with ideas and solutions divided into the following topics: Redesigning cropping systems, precision non-chemical weed control, weed biology, farmers' perceptions and decision-making and suppressive and tolerant varieties/crops.

One of these experts was Irish organic farmer Ben Colchester - "For over 40 years, at Drumeen Farm we have been developing a farming system that respects the soil, the livestock, the environment and the people who eat the produce". Drumeen farm is in County Kilkenny, it has been organic since 1976 and covers 185 acres. They produce oats for a processor and oilseed rape which they press and sell. They also have sucklers to beef and sheep which they sell direct to customers and organic markets. They also sell honey from their 50 hives and firewood from 60 acres of broadleaf forestry.



We talked to Ben about his experience as part of the EIP-AGRI Focus Group:

"I found the EIP-AGRI Focus Group was an opportunity to concentrate on new ideas as to how non-chemical weed control could possibly become a competitor to herbicide use, in this age of high crop production with limited labour. Following the second meeting, I was inspired to try out some changes on my farm.

Sowing cereals into a living mulch of clover

This process took a little bit of trial and error. So, following the Focus Group meetings, I thought I would try a living mulch of clover with the aim of trying to eliminate the annual weeds in clover by grazing with sheep and mowing. I planted a small-leafed white clover in 25 cm rows. Then once established, the plan was to sow winter oats between the rows of clover using a direct drill. But, this first trial was not so successful. Although the clover established well, despite

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the grazing and mowing there was a presence of chickweed which would have created a problem in the oats if we had gone ahead and sown them. I realised this was going to take a little more thought…

In the summer of 2019, I attended an event in the UK about the future of non-chemical weed control. Different technologies were demonstrated including the Garford camera vision guided inter-row hoe which I have used for many years. But I was not convinced by other technologies demonstrated, like electric weeders and hot foam weeders, I feel they have large energy requirements and so were not an elegant solution.

Coming home I felt the best solution might lie in using a mulch of some sort, but the crimper roller was not working in our damp climate here. We needed something that could terminate a cover crop at the beginning of the growing season in order to get a spring crop in. Waiting until the cover crop is at the correct stage for rolling down is just too late for any crop we grow.

So the next idea was to try using an under cutter in conjunction with the crimper roller. The idea being that if the cover crop is crimped and then the roots are sliced without disturbing how the cover crop lies on the ground, then weeds might not germinate and the crop can be sown through the dying mulch. At that stage I was afraid of another failure so I was not prepared to invest too much time and money into it, so I made a machine that might give an indication if it would work. It gave positive results! So I am now making a more permanent version of the machine - mounting the A shares on parallelograms with depth control wheels.

Modifying my machinery

Another change that came out of the Focus Group was my use of shares on my inter-row hoe. I had always wondered if the A blades would be more appropriate on my hoe compared to the L hoes I was using. I discussed this with some of the advisers in the Focus Group, they generally felt it depended on local context and preference. I ended up altering my hoe so that first of all I have a left hand L blade, followed by a right hand one and then followed by an A blade. It did a good job on my crops this year, which all suffer from a large seed bank.

In conclusion, I found our EIP-AGRI Focus Group helped focus on this topic and contributed contacts for future work. As a farmer it provided an insight into the academic world and helped me see a bigger picture where the whole of Europe is attempting to find a solution to our problems that exist in modern agriculture and even organic agriculture."

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Photos: Ben Colchester

Focus Group:

Non-chemical weed management in arable cropping systems

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