

Agroecology update

News on non-chemical weed management trials in UK (September 2017)

With support from the Marisla Foundation, facilitated via PAN North America, PAN UK is compiling information to inform colleagues in other PAN regions of relevant research, policy and practical experiences in agroecological farming and food provision in the European region.

As outlined in PAN UK's Agroecology Update *Research on low-input farming methods in UK* (July 2017), four 'field labs' in the Innovative Farmers network are exploring options for reducing herbicide use and managing weeds via mechanical, biological and cultural control methods. This update summarises progress aspects during 2017, compiled from updates posted on the Innovative Farmers network website (www.innovativefarmers.org) then 'Managing Weeds Without Herbicides') and other websites during Dec. 2016 to Sept. 2017.

Trial A. Finding alternatives to glyphosate for terminating cover crops

With the possibility of EU restrictions on glyphosate in 2018, practical alternatives to terminate cover crops is now high priority. This field lab is trying out a range of methods to kill off and incorporate living cover crops before sowing the next cash crop in the rotation. Trial plots are comparing 'control' treatments of (i) glyphosate application, (ii) bare stubble and (iii) current cultivation techniques, with the following mechanical or other destruction methods:

- using a roller/crimper to break/bend the cover crop stems
- mowing to remove the crop
- mulching (to smother the crop)
- rolling to break stems and then make use of subsequent action by frost to kill the plants
- shallow cultivations to bury the crop
- grazing by sheep
- applying liquid fertiliser

8 farmers are hosting trials over three seasons, located in west, central and eastern England on a mixture of conventional and organic farms. To enable quantitative comparison of costs and as standardised as possible assessment of the effectiveness of the alternative methods, all sites are sowing two standard cover crop mixtures of (a) oil radish and spring oats and (b) *Phacelia*, buckwheat, mustard and berseem clover. Farms aimed to sow their cover crops in the last two weeks of August or first week of September 2017, to avoid too much variation in sowing date, and to terminate the crops in Feb/March 2018.

Trial B. Cultural methods to control black grass

Mechanical weeding is becoming more important in conventional arable systems, due to (i) problems with weeds developing resistance to specific herbicide groups and (ii) increased pressure on farmers to reduce herbicide volumes used and impacts on the environment. By weeding between the crop rows in cereals and only applying herbicide in bands on the rows, herbicide use can be reduced considerably while still protecting the crop from competitive weeds. Field trials took place during spring 2017 to compare effectiveness of different

mechanical weeding equipment now available on the market in weed control in winter and spring sown wheat crops. The different trial treatments include:

- an untreated control
- mechanical weeder of the harrow-comb type (traditionally used for weeding between rows)
- rotary comb hoe
- Garford hoe (which can move precisely between rows)
- Combcut (which can cut out taller weeds above the crop, see Pesticides News 103 article from June 2016)

The trials aim to find out the best combinations of early and late season weeding equipment for different soil types, assessing weed control gained and final crop yield and costs.

For more info see the video via: <https://www.innovativefarmers.org/news/2017/april/26/putting-mechanical-weeders-through-their-paces/>

Trial C. Allelopathy in action: Buckwheat for couch grass control

This field lab is investigating the potential for sowing break or cover crops of buckwheat (and other crops) to reduce infestations of couch grass *Agropyron repens*, a vigorous, perennial weed. Trial treatments and assessment were agreed with host farmers in spring 2017. Because buckwheat is rather expensive, options to combine it with a partial fallow are being explored and to sow it in a mixed stand with clover cover crops. The trials will compare costs, including labour, work flows, as well as effectiveness in suppressing couch grass in different soil types and farm locations and in different combinations and timings of cultivation, sowing and incorporating the cover crop for soil fertility building.

For more information, see: <https://www.innovativefarmers.org/field-lab/?id=d2865f6b-e737-e611-80c9-005056ad0bd4>

Trial D. Controlling creeping thistle

This field lab is testing methods suitable in organic and low input systems for this problematic, broad-leaved and perennial weed. Preliminary results indicate that the most effective method is to use sub-soiling or deep surface cultivation at a depth of 18-20cm. Most tractor mounted cultivation tools will break up and turn surface soil to between 12-18mm but deeper cultivation appears effective in damaging the roots of the thistle, resulting in significantly less growth. As well as depth, timing is important too. If cultivation happens once the thistles have stopped growing in the autumn, this gives more time for their rhizomes to degrade over winter.

Further trials in 2017 will look at fine tuning the cultivation technique, but as cultivation is not a choice available for all low input farmers, the field lab will also look at other treatments including one biological control method based on the infective disease which causes thistles to go white and shrivel.

For more info see: <https://www.innovativefarmers.org/news/2016/december/20/a-solution-for-creeping-thistle/?count=13>