Deep plowing is a good method to fight thistles in grain production, but it is costly and very energy consuming. Tests in 2014 with the selective weed cutter CombCut show that this may be an option to control the thistle in organic grain production.

Silja Valand and Svein Ivar Ånestad | Norsk Landbruksrådgiving Østafjells

Creeping thistle, Canadian thistle (Cirsium arvense), is often a problematic weed in organic grain production. CombCut from the Swedish company Just Common Sense is a special tool against this problem. The concept consists of a tractor-mounted cutter bar with attached knives, sharp as razor blades. The knives are fixed, and “combs” through the field. The idea is that thick and stiff straw weeds like thistle and wild chamomile are cut, while the thinner and less rigid cereal straws pass between the blades. In 2014 Norwegian Extension Service Østafjells have made an evaluation of CombCut, where the subject was to investigate whether it can be useful in organic grain production.

Tests in oats

The experiment was laid out in an ecological field with Odal Oats in Vestfold. It was humus light clay in the soil and good growing conditions. The area is low-lying, and even though it was dry in Eastern Norway in the season 2014 it was relatively good humidity in the soil. The field was sown in mid-May. Parts of the experimental field was very infected with thistle. CombCut was used on 26 June. Oat was in the stem elongation phase and about 40 cm high. This was a bit late in the season. Ideally, the machine should be used somewhat earlier to avoid damage on grain plants. A visual registration of thistle, in form of coverage percentage, was done before the driving.

Slightly uneven surfaces

Settings on the weed cutter was made by a representative from the machine producer in Sweden. We chose to run with CombCut hanging in lifting the arms of the tractor and adjust the height by position control. Alternatively, the machine can run with the wheels on the ground, but because of the uneven level of the experimental field this was less preferable. It was relatively easy to use the machine. However, when there was uneven surfaces the machine occasionally dipped, causing cuts in the grain tops. This problem had been less if we had done the cutting slightly earlier. Again, we see the importance of a smooth seed bed in organic agriculture.

Thistle in different growth stages

The natural growth of the thistle had big variations in the test field. At the first measurement point the thistles were between 10 and 65 cm high, where about 50 percent of the weed plants ranged between 40 and 65 cm. The remaining 50 percent was lower than the oats. Other weeds were mainly Fathen (Chenopodium album), Marsh woundwort (Stachys palustris) and Treacle mustard (Erysimum cheiranthoides), but this only represented five to ten percent of the coverage. Registration was repeated.

Table 1. Results and recordings from the tests show that the treatment was effective.

<table>
<thead>
<tr>
<th></th>
<th>Yield kg / DAA 15% Water</th>
<th>Thistle % coverage 26.juni</th>
<th>Thistle % coverage 4.sept</th>
<th>HI-weight</th>
<th>1000-grain weight</th>
<th>Protein %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treated</td>
<td>Avling 434</td>
<td>32,5</td>
<td>22,5</td>
<td>54,9</td>
<td>30,7</td>
<td>13,0</td>
</tr>
<tr>
<td>Untreated</td>
<td>Behandla 312</td>
<td>35,0</td>
<td>62,5</td>
<td>54,5</td>
<td>31,0</td>
<td>13,0</td>
</tr>
</tbody>
</table>

Table 1. Results and recordings from the tests show that the treatment was effective.
The reduction of the thistle had a big impact on the corn yield. Before the harvest of the field September 4th, are shown in the two charts.

**Thistles decreased**

There was a significant difference in amount of thistles in the test area at harvesting. In all the fields where CombCut was run the amount of thistles was reduced. The untreated areas had an increase of thistles, see Chart 3) and Table 1. This confirms earlier tests by SLU in Sweden. The large amount of thistle, especially in the untreated areas created problems in harvesting. A lot of green plant mass increased amount of combine losses. At the same time a lot of thistle buds were not separated, and thus recorded as yield. This can create an uncertain harvest results, inform of higher yields than actual in the untreated areas. Consistently the treated areas gave higher yields, average 1500 kg/ha more than for untreated.

**Useful for some**

The aim was to investigate if CombCut may be useful for organic grain growers in our area. Based on the experiment, we see a clear advantage of the machine in fields with large amounts of thistle. This is also where the thistles create a significant economic loss.

The economic benefits with CombCut will be less with lower amount of thistle. Nevertheless, the machine is useful in combination with other measures to control the thistle. This also brings excitement to what effect the treatment will show in 2015. The capacity of CombCut is very good and for some, the usefulness of the equipment may be great.

silja.valand@nlr.no
svein.anestad@nlr.no