Cover Crop after Unsprayed Hay Barley, Broadwater County

Susan Tallman, NRCS Bozeman Area Agronomist and Kristin Fletcher, Bozeman Area Cartographer

County: Broadwater, near Townsend
Average annual precip: 11-12"
MLRA: 44B, Central Rocky Mountain valleys
Dominant Soil Type: Vd – Villy silty clay loam, drained
Acres: 14
Planting Date: Hay barley, May 25, 2015; Cover crop, Jul 25, 2015
Seeding Rate: 19 lb/ac
Seed cost: unknown
Seeding Method: Broadcast with fertilizer
Tillage: hay barley was planted no-till with a disc drill
Previous Crop and Year: 2015, Hay barley, harvested Jul 20, 2015
Herbicides: Pre: none
Post: none
Insecticides/Fungicides: none
Fertilizer: 100# of 16-20-0 broadcast on the 14 acres with cover crop
Irrigation: Pivot irrigation
Termination Method and Date: Frost, Oct 15, 2015
Next Crop: 2016, Hay barley followed with cover crop

Fig. 1. Cover crop Oct. 1, 2015. Susan Tallman.

Monthly Precipitation at Townsend, MT

<table>
<thead>
<tr>
<th>Roundup</th>
<th>J</th>
<th>F</th>
<th>M</th>
<th>A</th>
<th>M</th>
<th>J</th>
<th>J</th>
<th>A</th>
<th>S</th>
<th>O</th>
<th>N</th>
<th>D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 yr avg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.38</td>
</tr>
<tr>
<td>1981-2001</td>
<td>0.26</td>
<td>0.25</td>
<td>0.49</td>
<td>0.78</td>
<td>1.82</td>
<td>2.24</td>
<td>1.35</td>
<td>1.13</td>
<td>0.89</td>
<td>0.54</td>
<td>0.33</td>
<td>0.30</td>
<td>10.38</td>
</tr>
<tr>
<td>2014</td>
<td>0.20</td>
<td>0.68</td>
<td>0.73</td>
<td>0.94</td>
<td>0.23</td>
<td>2.26</td>
<td>1.09</td>
<td>2.50</td>
<td>0.74</td>
<td>0.45</td>
<td>0.75</td>
<td>0.23</td>
<td>10.80</td>
</tr>
<tr>
<td>2015</td>
<td>0.29</td>
<td>0.22</td>
<td>0.40</td>
<td>1.15</td>
<td>0.87</td>
<td>1.07</td>
<td>1.46</td>
<td>0.78</td>
<td>1.56</td>
<td>0.77</td>
<td>0.44</td>
<td>0.37</td>
<td>9.38</td>
</tr>
</tbody>
</table>

Fig. 2. Monthly precipitation at Townsend, MT. Western Regional Climate Center, station #248324.

Introduction:
This irrigated cover crop was seeded after hay barley harvest. The hay barley was not sprayed prior to cover crop planting, and volunteer barley regrowth was a major component of the cover crop. The producer’s goal is to have grazing options, diversity in the rotation, improve soil health, and provide cover and forage for pheasants.

Results:
NRCS staff visited the field on Oct. 1, 2015 and took three random clippings. The field was green and lush at the time of our visit. We separated the clippings into volunteer barley and brassica components in the field, then oven-dried the samples at MSU. There were 66 growing days between the date of seeding and the date of clipping, and 1519 growing degree days (base 40) during that same period. Total aboveground biomass was 2800 lb/ac, or 1.4 t/ac. For grazing purposes, there were about 1.5 AUMs/ac, or 21 total AUMs available in this field. Volunteer barley dominated the stand, composing 79% of the aboveground biomass, while brassicas were about 21% of the total biomass. Radishes and turnips were each planted at a high rate. Maximum rate for each of these species in a mix is 0.5 lb/ac. Annual ryegrass was nowhere to be seen at the time of sampling. However, NRCS staff from Madison County report that it may appear in 2016, due to seed dormancy.
Summary and Discussion:

It is interesting to note that this cover yielded 1.4 t/ac, while a similar cover crop following hay barley less than five miles away yielded 2.4 t/ac (see “Cover Crop after Sprayed Hay Barley, Broadwater County”). The volunteer hay barley in the other case study was sprayed out after haying, limiting the competition from volunteer barley. In this case, cattle were turned out for grazing on Oct 25, 2015 and the entire field under the pivot was grazed. The producer waited ten days after the frost to avoid the potential of high nitrates, and 100 head of cattle grazed for two weeks. It should be noted that MSU Extension provides rapid-result nitrate tests for producers concerned with the quality of their grazing forage. This producer did have his hay barley tested and it was below the level of concern (300 ppm). The producer observed that the cows improved their body condition score by 1 point after grazing.

Fig. 3. Overhead view of cover crop at time of clipping, Oct. 1, 2015. Notice dominance of hay barley. Susan Tallman.

Fig. 4. Worm castings on the soil surface. Oct. 1, 2015. Susan Tallman.

<table>
<thead>
<tr>
<th></th>
<th>Seeding Rate lb/ac</th>
<th>Cover Crop Biomass %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radish</td>
<td>5</td>
<td>21*</td>
</tr>
<tr>
<td>Turnip</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>Annual ryegrass</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Volunteer barley</td>
<td>--</td>
<td>79</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 5. Comparison of seeding rate vs actual aboveground biomass percentage.

*21% is the combined total biomass of both the radish and turnip.