Irrigated Cover Crop for Grazing, Meagher County

Jennifer Paddock, Meagher County District Conservationist

County: Meagher
Average annual precip: 14”
MLRA: 44B Central Rocky Mountain Valleys
Dominant Soil Type: 327 A Mussleshell loam 0-2% slopes
Acres: 85
Planting Date: June 10th, 2016
Seeding Rate: 39 lb/acre
Seed cost: $21.73/acre
Seeding Method:
Row Spacing:
Tillage:
Previous Crop and Year: Hay barley (2015)
Herbicides: Pre: None
Post: Broadleaf herbicide applied in August to control mustard
Insecticides/Fungicides:
Fertilizer: none
Irrigation: Pivot sprinkler irrigation
Termination Date: Sept 20th, 2016
Termination Method: Grazing
Next Crop: Hay barley (2017)

Fig. 1. Cover crop August 9th, 2016.

Monthly Precipitation at White Sulphur Springs, 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>15 yr avg 2001-2016</td>
<td>1.68</td>
<td>0.27</td>
<td>.64</td>
<td>1.37</td>
<td>1.97</td>
<td>2.45</td>
<td>1.27</td>
<td>1.24</td>
<td>1.20</td>
<td>0.92</td>
<td>0.41</td>
<td>0.39</td>
<td>13.82</td>
</tr>
<tr>
<td>2015</td>
<td>0.17</td>
<td>0.26</td>
<td>0.20</td>
<td>1.13</td>
<td>2.16</td>
<td>1.30</td>
<td>1.77</td>
<td>0.27</td>
<td>1.30</td>
<td>0.53</td>
<td>0.53</td>
<td>0.97</td>
<td>10.59</td>
</tr>
<tr>
<td>2016</td>
<td>0.12</td>
<td>0.08</td>
<td>0.60</td>
<td>0.94</td>
<td>2.03</td>
<td>1.13</td>
<td>1.78</td>
<td>0.58</td>
<td>2.57</td>
<td>1.6</td>
<td>.05</td>
<td>0.37</td>
<td>11.85</td>
</tr>
</tbody>
</table>

Fig. 2. Monthly precipitation at White Sulphur Springs, MT. Western Regional Climate Center, station #243403.

Introduction:
This location is at high elevation for crop production, near 5000 ft, where cool-season plants dominate the native range. His main goal is to extend the grazing season in the fall, when the cows have returned to home pastures, and to provide soil health benefits from grazing. This cover crop was planted on an irrigated alfalfa field during the renovation phase to provide fall grazing.

Results:
Visited July 21, 2016. Cover crop growing well, but weedy mustard was growing even better. Because of concern of the mustard going to seed a broadleaf herbicide was applied on August 3rd. Clipping was completed on Aug 9, 2016. There were 66 growing days from the time of seeding to the time of clipping, with 1241 growing degree days (base 40) in the same period (WSSM Agrimet station). Four clippings were taken in soil type 327A. Plants were air-dried at
the office. Total aboveground biomass after air-drying was 5850 lb/acre, or 2.9 tons/acre. Assuming 915 lbs of forage per animal month, and 50% utilization rate on 85 acres, there were 273 AUMs available in this field, or 3.2 AUMs per acre.

**Summary and Discussion:**

The biggest lesson learned in the irrigated trial is importance of using a burndown herbicide prior to planting. Because of the diversity of species, there are limited herbicide options once the stand is seeded. Weedy mustard reduced the overall productivity of this cover crop, decreased the amount of good forage, and limited what can be planted the following year. Broadleaf herbicide application on August 3rd decreased the forage potential for this field. Not surprisingly, sorghum-sudangrass did not perform well in this cool climate.

180 cows were turned in to graze on Sept 20th. Cows appeared to do well on the mix but the amount of grazing provided was less than the producer hoped for due to low quality from high carbon residue. These cattle were new to cover crop grazing and walked the perimeter of the field for days until they started to graze the cover crop. There was sufficient grass and alfalfa in the same field to allow the cattle other forage choices and become slowly acquainted with this new forage.

The broadleaf herbicide may have continued to kill broadleaf plants after our clipping, further reducing the amount of desired forage. By November 9th cattle had removed the high quality portions of the plants such as seed heads, turnip and radish tubers, but there was still lots of high carbohydrate material such as stems. Rather than return to alfalfa in 2017, the producer will plant hay barley to allow an additional year for mustard control.

![Fig. 3 and 4. Cover crop towards end of grazing, November 8th 2016. Quantity left but quality is gone. Herbicide likely killed forage kale and turnips that would have helped extend the quality.](image)

<table>
<thead>
<tr>
<th>Species Planted</th>
<th>Variety</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Triticale</td>
<td>Taza</td>
<td>Good</td>
</tr>
<tr>
<td>Sorghum Sudan grass</td>
<td>Grazex BMR 718</td>
<td>Poor</td>
</tr>
<tr>
<td>Turnip</td>
<td>Purple Top</td>
<td>Good</td>
</tr>
<tr>
<td>Safflower</td>
<td>Finch</td>
<td>Fair</td>
</tr>
<tr>
<td>Peas</td>
<td>Arvika</td>
<td>Good</td>
</tr>
<tr>
<td>Forage Collard</td>
<td>Impact</td>
<td>Good</td>
</tr>
<tr>
<td>Oats</td>
<td>AC Mustang</td>
<td>Good</td>
</tr>
<tr>
<td>Annual sunflower</td>
<td>VNS</td>
<td>Good</td>
</tr>
</tbody>
</table>

![Fig. 5. Species visual performance.](image)