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Using Small Grains for Forage

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In Southern Indiana, mild winters and hot, droughty summers occur with high regularity. Crops during the droughty summer are very risky on marginal soils. The periods of least risk for the production of field crops occur during the spring and autumn seasons. Cropping systems built around winter annuals as well as a mixture of cool and warm season perennials would appear to be a rewarding field of research on the marginal soil types of southern Indiana.

Since many varieties of winter cereals are available and well adapted for grain production, it appeared wise to explore their forage production potential. Some evidence of their value was gained through previous experiments conducted by D. L. McCune, et. al. at Corydon and Bedford in 1951, '52 and '53. Data from these experiments show that winter rye, wheat, barley and oats can extend the grazing season in both late fall and early spring. In clipping treatments, over a ton of dry forage was obtained in early spring (March, April and May) and approximately a half-ton in the fall, (September, October and November).

Winter rye produced the greatest quantity of forage in both the fall and spring months, but was lowest in protein. Winter oats produced the smallest quantity but were highest in protein. Winter wheat and barley produced nearly as much forage as rye, with the protein approaching that of winter oats.

Winter rye's spring vegetative growth came earlier than the other winter cereal species. This was particularly true for Balbo. A later variety, Tetra Petkus, produced a spring vegetative growth similar to the earlier winter wheat and barley varieties, such as Knox and Kenbar. The vegetative spring growth in winter oats was latest in the four winter cereals.

Summary

When considering all factors, it appears that winter wheat is the best producer of forage of the four winter cereal species. This is particularly true since we now have the variety "Dual", with Hessian fly resistance; thus making it possible to plant wheat much earlier in the fall. Winter barley's spring growth was slightly earlier than winter wheat's. Seed tables 1 and 2.

From the data which follow, it is evident that wheat produced almost as much forage as rye and was better in quality. Wheat produces forage later in the spring and over an equally long period in the fall. Lateness in the spring is an important advantage of wheat over the other earlier species. Fields are often too soft for grazing or for harvesting silage in early spring.

The lateness of winter wheat offers greater latitude as to the time of harvest allowing more favorable selection of favorable field conditions.
When compared to barley, wheat produces about the same quantity as well as quality, plus being more winter-hardy. Wheat is far better adapted to heavy soils than barley and more resistant to the current disease and insects than the present barley varieties. When comparing wheat to winter oats, it produces more and almost as high in quality. It produces much more in fall and early spring, but less in the late spring. Wheat is considerably more winter-hardy than oats, thus it is better adapted to heavier soils over southern Indiana.

New Research

Since it appears that winter wheat could be used as a valuable forage producer, further studies designed to answer some of the basic cultural problems have been initiated during the late summer of 1956. These studies will attempt to determine the best combination of cultural treatments to produce the following effects:

1. The maximum forage yields in the fall.
2. The maximum forage yields in the spring.
3. The maximum forage yields in both fall and spring.
4. The effect of forage harvests on grain production.

Table 1. Fall and Spring Forage Yields from Winter Cereals 1/

<table>
<thead>
<tr>
<th>Harvest Date</th>
<th>Dual Wheat</th>
<th>Balbo Rye</th>
<th>Kenbar Barley</th>
<th>Forkedear Oats</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 27</td>
<td>814</td>
<td>1337</td>
<td>670</td>
<td>591</td>
</tr>
<tr>
<td>April 16</td>
<td>985</td>
<td>877</td>
<td>1459</td>
<td>1021</td>
</tr>
<tr>
<td>May 14</td>
<td>394</td>
<td>600</td>
<td>514</td>
<td>1119</td>
</tr>
<tr>
<td>Total</td>
<td>2193</td>
<td>2814</td>
<td>2642</td>
<td>2731</td>
</tr>
</tbody>
</table>

pounds of dry matter per acre at Corydon, 1953

| April 16     | 998        | 1144      | 866           | 721           |
| May 14       | 1617       | 1653      | 1348          | 1684          |
| Total        | 2615       | 2797      | 2214          | 2405          |
| Spring Average | 2404     | 2805      | 2428          | 2568          |

pounds of dry matter per acre at Bedford, 1952

| October 17   | 788        | 983       | -             | 165           |
| Fall and Spring Totals | 3192  | 3788      | -             | 2733          |

1/ These data were obtained by D. L. McCune, et. al. on the Moses Fell Annex Farm near Bedford and H. Kaiser Farm near Corydon.
Table 2. Forage and Grain Yields from Winter Cereals, 1955 1/ (Southern Indiana Forage Farm)

<table>
<thead>
<tr>
<th>Species and Variety</th>
<th>Forage Yield per Acre</th>
<th>Grain Yield per Acre After Forage Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dry Wt.</td>
<td>Protein</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Winter Wheat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual</td>
<td>2319</td>
<td>—</td>
</tr>
<tr>
<td>Vigo</td>
<td>2271</td>
<td>—</td>
</tr>
<tr>
<td>Knox</td>
<td>1998</td>
<td>—</td>
</tr>
<tr>
<td>Average</td>
<td>2196</td>
<td>19.4</td>
</tr>
<tr>
<td>Winter Rye</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Rye</td>
<td>2260</td>
<td>—</td>
</tr>
<tr>
<td>Tetra Pekkus</td>
<td>2294</td>
<td>—</td>
</tr>
<tr>
<td>Balbo 2/</td>
<td>2425</td>
<td>—</td>
</tr>
<tr>
<td>Average</td>
<td>2326</td>
<td>16.4</td>
</tr>
<tr>
<td>Winter Barley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kenbar</td>
<td>2526</td>
<td>—</td>
</tr>
<tr>
<td>Hudson</td>
<td>1960</td>
<td>—</td>
</tr>
<tr>
<td>Ky #1</td>
<td>1988</td>
<td>—</td>
</tr>
<tr>
<td>Average</td>
<td>2156</td>
<td>18.1</td>
</tr>
<tr>
<td>Winter Oats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkwin 3/</td>
<td>1823</td>
<td>—</td>
</tr>
<tr>
<td>Forkeddeer</td>
<td>1776</td>
<td>—</td>
</tr>
<tr>
<td>Dubois</td>
<td>1361</td>
<td>—</td>
</tr>
<tr>
<td>Average</td>
<td>1653</td>
<td>21.6</td>
</tr>
</tbody>
</table>

1/ All species were planted September 27; fertilizer—300 lb. of 4-24-12 at planting time, 20 lb. of nitrogen was top-dressed April 10; forage harvest was made May 5; grain harvest on July 17.

2/ Balbo had begun to head when harvested for forage, thus no re-growth for grain production.

3/ Arkwin was stunted by cold weather in late March and early April.
Cereal-vetch silage making. Cut June 1, yield was about 5½ tons. When properly ensiled, it's a high protein crop.

These cattle are grazing winter wheat and crimson clover. Picture was taken about May 5.

Cattle grazing on rye seeded in orchard-grass-birdsfoot trefoil sod. This seeding practice extended grazing 4 weeks in the fall of 1955 and 3 weeks earlier in the spring of 1956.

This harvest of winter oats for silage yielded nearly 6 tons. Oat silage is very palatable, but winter wheat and rye production is more dependable than oats or barley in the face of early wet springs.