Soybeans for Horses and Mules

By C. W. Crawford and J. L. Edmonds

Soybean Hay Curing in the Field
Summary

A number of farmers in central Illinois have found rations of soybean hay and corn or soybean hay, corn, and oats to be very satisfactory for feeding work horses. The amount of oats fed generally has been less than the amount of corn; in no case has it been more than half the grain ration.

Soybean straw has been found to be a very satisfactory roughage for wintering idle work horses and mules. Other straws may be fed with it and also a little grain if conditions necessitate it.

A small amount of beans fed in the spring seemed to aid in getting a horse's hair smooth and sleek.

Soybean hay has been found to be an excellent roughage for fattening mules. Mules fed on this hay finished with exceptionally smooth coats of hair. Fattening mules also gained well on soybean pasture.

The following varieties of soybeans were grown on the central Illinois farms that were visited: Midwest (Mongol), Ebony (Black Beauty), Peking (Sable), Illinois 13-19, Virginia, Wilson, and the A. K. Most of these varieties were selected for hay or pasture rather than for seed. Other varieties might be better adapted to other localities.

No bad results have been reported to this Station from the feeding of soybeans in any form to horses or mules.
The rapidly increasing acreage of soybeans in Illinois has created a demand from farmers for information concerning the uses which may be made of this crop in feeding work stock and in growing young horses and mules. Since, at the present time, the horse division of the Experiment Station has no experimental data on the feeding of soybeans or their products, it was thought that a presentation of the experiences of some of the farmers in the state in feeding soybeans to horses and mules might prove helpful. The information contained in this circular was obtained by visiting some of the leading soybean growers of the state, noting the condition of their work stock, and recording their experiences and opinions regarding the feeding of this crop.

The principal use which these men have made of soybeans in their feeding operations has been as a roughage. Soybean hay has been used to a considerable extent, and nearly every farmer who has had any amount of soybean straw has fed some of it to his horses. To date, very little use has been made of the beans as a concentrate for horses and mules, and it seems improbable that their use for this purpose will increase much in the future. In most instances, farm horses can be fed satisfactorily on a ration composed entirely of feeds commonly grown on the farm without the addition of any concentrate containing a high percentage of protein. This is particularly true when the crop rotation contains a sufficient acreage of legumes.

Soybean Hay Is Equal to Alfalfa in Total Digestible Nutrients

Data in Table 1 show how soybean hay, straw, and seed compare in composition with a few of the more common feeds. When only the amounts of digestible nutrients which these feeds contain are considered, soybean hay apparently is fully as valuable as clover or alfalfa. However, the stems of soybean hay usually are coarser and more woody than those of alfalfa; consequently there is considerably more waste with it, as a rule, than with alfalfa. (In a lamb feeding trial at this Station, lambs receiving soybean hay refused 24 percent of the hay, while lambs on alfalfa hay wasted only 8 percent.) However, the parts ordinarily wasted are below the average feeding value of the whole plant, for it is the best part of the hay that is eaten and the poorer parts that are refused.

In comparing soybeans and alfalfa for hay, it must be remembered that alfalfa will yield more per acre, on the average, than soybeans, and also that a stand will last for a number of years, while soybeans must be planted each spring. On the other hand, soybean hay is harvested at a time when most farmers are not so busy with other crops as they are when alfalfa is ready to cut. Soybeans are also very useful to put in where one has been unable to secure a good stand of clover or some other crop, since they are not planted until rather late in the spring. After soybeans are harvested, the ground may be seeded to wheat without further preparation. Soybeans are more or less resistant to acidity in soils, while alfalfa is not.

**Soybean Straw Compares Favorably with Timothy Hay in Analysis**

Soybean straw in analysis seems to be only slightly lower in feeding value than timothy hay, containing five pounds less digestible nutrients per hundred pounds of feed. The nutritive ratio of the two feeds is about the same. Timothy hay is finer, of course, and usually will be eaten up cleaner.

**Soybean Straw Is Superior to Oat Straw in Protein Content**

As compared with oat straw, soybean straw contains about three times as much digestible crude protein, but it is not so rich in carbohydrates, making its nutritive ratio much narrower than that of oat straw. In total digestible nutrients these two feeds are about equal. Their comparative values would depend upon several factors. If considered on a tonnage basis, the oat straw might rate higher when fed to mature idle animals, for a considerable portion of the soybean straw would be wasted because of its coarse, woody character, while the oat straw, if of good quality, would be eaten up closely. (In a lamb feeding trial at this Station, the lambs receiving soybean straw refused from 42 to 45 percent of it.) However, when soybean straw and oat straw are fed under ordinary farm conditions, especially to growing or fattening animals, where the horses are allowed to pick over the straw and the uneaten part is used for bedding, the soybean straw seems to be the better feed.

**Soybean Seed Is Rich in Protein and Fat**

Soybean seed is a very concentrated feed. In digestible crude protein content it is equal to linseed oil meal, and in the quality of protein it is superior, containing more of the amino acids, which are necessary for growth. There is over twice as much digestible fat in the soybean as in linseed oil meal.
Soybean Hay Compares Favorably with Other Feeds in Mineral Content

So far as can be judged from chemical analysis, soybean hay is equal to alfalfa or clover hay in mineral content. Soybean seed contains considerably more lime and phosphoric acid than corn or oats but not so much as linseed oil meal.

### Table 1.—Digestible Nutrients, Lime, and Phosphoric Acid in Some of the Common Horse Feeds

(Expressed in pounds per hundredweight)

<table>
<thead>
<tr>
<th>Feed</th>
<th>Crude protein</th>
<th>Carbohydrates</th>
<th>Fat</th>
<th>Total digestible nutrients</th>
<th>Nutritive ratio1:</th>
<th>Lime</th>
<th>Phosphoric acid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hays</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Alfalfa</td>
<td>10.6</td>
<td>39.0</td>
<td>0.9</td>
<td>51.6</td>
<td>3.9</td>
<td>1.95</td>
<td>.54</td>
</tr>
<tr>
<td>Clover</td>
<td>7.6</td>
<td>39.3</td>
<td>1.8</td>
<td>50.9</td>
<td>5.7</td>
<td>1.60</td>
<td>.39</td>
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<tr>
<td>Soybean</td>
<td>11.7</td>
<td>39.2</td>
<td>1.2</td>
<td>53.6</td>
<td>3.6</td>
<td>1.72</td>
<td>.68</td>
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<tr>
<td>Timothy</td>
<td>3.0</td>
<td>42.8</td>
<td>1.2</td>
<td>48.5</td>
<td>15.2</td>
<td>.25</td>
<td>.31</td>
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<tr>
<td><strong>Straws</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Oat</td>
<td>1.0</td>
<td>42.6</td>
<td>.9</td>
<td>45.6</td>
<td>44.6</td>
<td></td>
<td>.21</td>
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<tr>
<td>Soybean</td>
<td>2.8</td>
<td>38.5</td>
<td>1.0</td>
<td>43.5</td>
<td>14.5</td>
<td></td>
<td>.12</td>
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<td><strong>Concentrates</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No. 2 corn</td>
<td>7.1</td>
<td>64.6</td>
<td>4.4</td>
<td>81.7</td>
<td>10.4</td>
<td>.02</td>
<td>.66</td>
</tr>
<tr>
<td>Oats</td>
<td>9.7</td>
<td>52.1</td>
<td>3.8</td>
<td>70.4</td>
<td>6.3</td>
<td>.14</td>
<td>.81</td>
</tr>
<tr>
<td>Linseed oil meal</td>
<td>30.2</td>
<td>32.6</td>
<td>6.7</td>
<td>77.9</td>
<td>1.6</td>
<td>.51</td>
<td>1.70</td>
</tr>
<tr>
<td>Soybeans</td>
<td>33.2</td>
<td>24.7</td>
<td>16.1</td>
<td>94.1</td>
<td>1.8</td>
<td>.29</td>
<td>1.37</td>
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</tbody>
</table>

Note.—Lime contains 71.4 percent calcium; phosphoric acid contains 43.6 percent phosphorus.

Soybean Feeding in Champaign County

Mr. W. E. Riegle, manager of the Chas. L. Meharry farm at Tolono, raises soybeans on a large scale, having 275 acres in beans last year. He feeds his work horses soybean hay and ear corn. If the hay is of good quality, he feeds just enough so they will clean it up well. However, he finds that when the stems are coarse and woody, or when a large amount of hay is fed, the horses will not eat many of the stems. These horses have shown no ill effects from the soybean hay and stand the heat well.

On this farm, a lot of about sixty grade draft colts were fed as yearlings and two-year-olds. In summer they ran on a mixed clover pasture consisting chiefly of sweet clover but containing some red and alsike clover also. In winter their ration consisted mainly of soybean

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2Taken by special permission from *Feeds and Feeding*, by Henry and Morrison, 18th edition.
straw. They were fed all they would eat on frozen ground. During the first winter a little soybean hay was fed and from March first until time to turn the horses on pasture they were given three or four ears of corn per head daily. They kept in good condition on this ration and made satisfactory gains. This feeding plan was considered a very practical and economical way to grow out these colts.

The Midwest (Mongol) and Ebony (Black Beauty) varieties of soybean are liked best for hay on the Meharry farm. The favored rotation is corn, soybeans, wheat, and clover.

Mr. John T. Smith, of Champaign, has raised soybeans for fourteen years and has used the hay and straw in feeding his grade Percheron and grade Shire horses. His standard ration is soybean hay and ear corn, altho he feeds a little oats occasionally. In winter his horses run to a stack of soybean straw and in stalk fields in which soybeans have been grown with the corn. His horses are thrifty, stand the heat well, and have shown no bad effects from this method of feeding. Mr. Smith finds that his horses clean up the stems reasonably well even if they are a little coarse. He prefers the Ebony (Black Beauty) bean for hay.

Experience of a DeWitt County Farmer

Mr. Charles Walker and son Carle, of Clinton, have used soybeans in feeding their pure-bred Percherons for a number of years. Some of their older horses have received practically no other roughage for eight or ten years. Except in winter, soybean hay forms the sole roughage for these horses. They are fed from twelve to eighteen pounds daily together with about eight ears of corn three times a day. In winter they are fed soybean hay twice daily and all the oat straw and soybean straw they want. The straws are fed from racks. From one-third to one-half a feed of grain is also given twice daily.

The Walker horses do well on these rations. Mr. E. T. Robbins, former farm adviser of DeWitt county, states that they are always kept in good flesh. On page 2 are shown a two-year-old filly and a six-months-old stallion foal grown on a soybean hay ration on this farm. The colts seem to do fully as well as the mature horses. Mr. Walker says that soybean hay keeps the bowels in good condition but does not cause scouring. He believes that the hay should not be cut too green for horses. The Ebony (Black Beauty) bean is raised on the Walker farm.

Use Made of the Soybean by Adams County Farmers

Mr. Russell Davis, of Clayton, has raised soybeans for ten years. He has used the hay, straw, and beans in feeding his grade draft horses,
but has made more use of soybean straw than of the hay or the beans. When feeding straw, he gives the horses all they will eat, with grain according to the amount of work they are doing. If they are not working he gives them only a light feed of grain in addition to the straw. If they are working, he adds corn and oats in about equal proportions and at times one part of beans to ten parts of oats. During a part of the winter Mr. Davis feeds a sheaf of bean hay twice daily and one feed of silage.¹

Mr. Davis advocates the planting of beans with corn to be pastured along with the stalks during the winter by work horses. Concerning this use of soybeans, he says: “The more we see of this practice the better we like it. It is remarkable how it will cheapen the board bill on a bunch of work horses. The last two winters have been unusually favorable to getting the most out of this practice, as there has been no time up to March first that any damage would be done by tramping. The success of this proposition depends very largely upon the use of a variety of soybeans that will stay in the pod all winter, and there are only a few varieties that will do this.” Mr. Davis has had no bad results from feeding soybeans and his horses are in good condition. He prefers the Peking (Sable) variety of soybeans for hay.

Other Adams county farmers who have used soybean hay or straw in feeding horses or mules are Mr. Roy Morton and Mr. D. W. McClintock, of Golden, Mr. E. L. Anderson and Mr. John M. Longlet, of Paloma, and Mr. J. W. Meatheringham, of Camp Point. They have used the straw and hay as a ration for idle horses and mules, both as a complete ration and also in connection with oat straw and stalk fields. Most of these farmers plant soybeans with their corn to be pastured with the corn stalks after husking. Three of these men have found that feeding a pint of beans two times daily with the grain in the spring is a great help in getting a horse’s hair in good condition. Ear corn forms the bulk of the grain rations fed, altho at times oats make up as much as half of the grain fed. The following varieties of soybeans are grown by these men: Peking (Sable), Illinois 13-19, Ebony (Black Beauty), Virginia, and Wilson.

Soybeans for Fattening Mules

Mr. Theo. Smith of Auburn, Sangamon county, has used soybeans extensively for feeding mules, both as hay and straw and also as pas-

¹Silage forms a part of the rations used by several of the men whose methods of feeding are discussed in this circular. The advisability of using this feed is a moot question among horse and mule men. Some of the men mentioned have fed it successfully over long periods of time and one of these men has fed it to large numbers of animals. On the other hand, some feeders have had disastrous results from the use of this feed for horses.
tured. Until recent years, he fed an average of three hundred head of mules yearly. When feeding soybean hay, he gave them twice daily all they would clean up. The grain ration consisted of ear corn and oats fed in separate bunks. The amount of oats fed depended on the maturity of the beans, less oats being fed with the more mature beans; if they were well matured no oats were fed. At times one feed of silage per day was added to the ration, the amount being limited to just as much as the mules would clean up. When silage was included in the ration, oat or wheat straw also was added to prevent scouring. Mr. Smith states that his mules never scoured on soybean hay or soybean straw alone, but that when silage was used, they would scour unless oat or wheat straw was added.

When soybean straw was fed instead of soybean hay, it was kept before the mules all the time. More oats and less corn were fed with the straw than with soybean hay.

Mr. Smith considers soybeans a very satisfactory pasture for mules. He has used them in this way both alone and planted in corn and has never experienced any trouble resulting from them. He allows the beans to mature before turning the mules on them. One bunch which he let run on soybean pasture and fed corn from bunks did exceptionally well.

The work mules on this farm were fed in about the same way as the mules that were being fattened. They stood the heat just as well on soybean hay as when eating other kinds of hay.

Mr. Smith feels that soybeans are an excellent feed to put bloom on a mule's coat. This is a very important point in favor of soybeans for fattening mules, for if a mule is to sell to the best advantage, its hair must be short, smooth, and glossy.

The Ebony (Black Beauty), Midwest (Medium Yellow), and Peking (Sable) varieties of soybeans are raised on this farm.

Mr. Strother G. Jones, of Buffalo, Sangamon county, uses soybean hay and sweet clover pasture in extensive feeding operations with mules. When this information was secured, he was feeding one hundred and twenty-five head, a number of which were show animals. One lot, consisting of forty-eight high-class sugar mules, was being fed all the soybean hay they would eat along with cane hay and ear corn. Linseed oil meal was added to the ration toward the end of the feeding period. The soybean hay fed to this lot was not of the best quality but the mules ate it readily and did well on it. A letter from Mr. Jones states that these mules were in excellent condition when marketed, their hair being especially fine. He believes that this bloom was due in a large measure to the oil of the bean in the soybean hay. Mr. Jones has experienced no bad results from feeding soybean hay. He raises the A. K. bean.