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Inoculate Your Soybeans

A. G. Norman

Iowa State College

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original respective rations. The third group of cows served as a check on the other two groups and received a ration of roughage plus a full amount of grain throughout the experiment.

The second year a new design was devised in which 18 Holstein cows were used in the investigation. These cows were divided into six groups of three cows each, the animals in each group being selected with as much uniformity as possible in age, size, stage of lactation and production. The experiment consisted of three 6-week periods with 1 week out between periods to adjust the cows' rations.

The system in this trial was such that each cow in each group received a different ration during each period. The rations fed this second year were quite similar to those of the first year. They consisted of roughage alone, roughage plus a limited amount of grain (1 pound of grain to each 7 pounds of milk produced), and roughage plus a full amount of grain (1 pound of grain to each 3½ pounds of milk produced). These rations were fed in different order to each group so that each ration was preceded in its feeding order by every other ration an equal number of times throughout the trial. This was done to evaluate the carry-over effects of nutrient consumption on milk production which might occur in changing from one ration to another.

Farmers who look for immediate responses to changes in rations will do well to remember that such responses do not come quickly. It takes time, for instance, for a cow which has been fed roughage alone to increase her milk yield once you begin to feed her grain. Part of the grain must be used by that cow to restore the reserves in her body which have been removed to sustain the flow of milk during the time she was fed only roughage. On the other hand, a cow will continue to produce at a relatively high level after grain is dropped from her ration because she will use her body reserves to keep up the flow of milk.

**Inoculate Your Soybeans**

Survey Indicates One Field in Four or Five Is Not Inoculated or Is Not Inoculated Properly

**By A. G. NORMAN**

No one has had any very definite information as to the percentage of beans inoculated at the time of planting or, what is perhaps more important, as to the actual amount of nodulation to be found in the field in Iowa. Estimates of the latter made by persons in a good position to express an opinion on this subject have ranged all the way from one-third to nearly 100 percent of the fields.

In order to obtain a more satisfactory answer to this question the Iowa Station made a survey this past season in two counties, Hardin and Monona. We restricted the survey to the bottomland townships of Monona County because almost all the beans are found there. Both counties had a substantial acreage of beans in 1942, but they differed markedly in past history. In Hardin County the soybean acreage has expanded for the past 5 years, whereas in Monona County soybeans are almost a new crop.

Accordingly, nodulation would only be general in Monona County if the seed was inoculated in 1942. In Hardin County, on the other hand, many of the fields must have

<table>
<thead>
<tr>
<th>TOTAL ACREAGE IN SOYBEANS</th>
<th>1917</th>
<th>1918</th>
<th>1919</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardin County</td>
<td>7,509</td>
<td>11,157</td>
<td>17,904</td>
</tr>
<tr>
<td>Monona County</td>
<td>343</td>
<td>675</td>
<td>1,128</td>
</tr>
<tr>
<td>1940</td>
<td>1941</td>
<td>1942</td>
<td></td>
</tr>
<tr>
<td>Hardin County</td>
<td>20,589</td>
<td>13,561</td>
<td>27,896</td>
</tr>
<tr>
<td>Monona County</td>
<td>2,032</td>
<td>3,277</td>
<td>22,000</td>
</tr>
</tbody>
</table>

*Estimate made by County AAA officers, others from assessors' records.*
been planted to beans before and nodulation could occur either because the seed was inoculated or because sufficient bacteria remained in the soil from a previous crop.

In making the survey we sampled fields at random in the county, digging plants at several places in the field. If nodules were absent, or if the plants were only poorly nodulated, we examined the field more carefully.

The results in the two counties were not greatly different and indicate that the major part of the soybean acreage was, in fact, well nodulated. We reported nodulation as poor when nodules could be found only on occasional plants or if nodulation was patchy in the field. In both counties there must have been failure to inoculate or to inoculate properly between one-fourth and one-fifth of the fields.

Most of the unnodulated fields were normal in appearance and only in a few cases did the plants appear to be of a lighter color, which is ordinarily a symptom of nitrogen deficiency. These unnodulated plants, however, were not living a legume existence—they were getting all of the nitrogen they used from the soil. If a soil is quite high in nitrogen content, then the difference in yield and growth between nodulated and unnodulated beans may not be great.

If the soil nitrogen supply is low, then the effect of nodulation in increasing the yield and nitrogen content of the plant is likely to be greater. This is the reason why we cannot say definitely that inoculation will always increase the yield by a certain and exact percentage. But we can say that with beans at $1.60 per bushel (or somewhat less if they were frosted), it took only a very small yield increase to pay for the inoculant and the extra time taken in inoculating the seed.

The various commercial inoculants now on the market are almost all satisfactory as a result of regulatory laws in a number of states. (Iowa has a special labeling requirement for inoculants.) Failure to obtain satisfactory nodulation when seed has been inoculated is not likely to be due to poor inoculant but usually to lack of care in handling the inoculant or the inoculated seed.

Two types of inoculant are available: the "humus" type in which the bacteria are grown first in a liquid and then this liquid is absorbed by mixing with finely ground peat; the "jelly" type in which the bacteria are grown directly on jelly. Many farmers find the former type the more convenient, but drying-out must be avoided. Inoculant should not be part-used, left open on a shelf in the barn, and then used later when dried up. For the same reason, inoculated seed should be planted reasonably soon and not left in the drill or planter out in the field over the week-end or put back in the sack for later use without re-inoculation.

### Iowa to Grow Hemp

Some Iowa farmers have been asked to produce hemp in 1943 for war aid.

Fifteen counties in north-central Iowa have been designated as the probable growing area.

Only level, well-drained, fertile fields are recommended for hemp growing. Uniform soils are necessary to produce hemp with a uniform height. Hemp closely resembles corn in its plant nutrient requirements, so that farmers are generally advised to select their hemp area from the best corn land on the farm.

The production of hemp in the United States has become a war necessity. Since the source of other strong fibers has been cut off, large quantities of hemp are needed for the manufacture of rope and other types of cordage for the army, navy, merchant marine and essential civilian uses.

The government has agreed to furnish the hemp grower with seed and harvesters, binders or "pickers," these to be provided at the grower's expense. A harvesting schedule will be arranged to insure efficient and equitable use of harvesting machinery, and the grower must agree to observe this schedule.

Hemp is an annual crop that is sown in the spring like small grain and produces a thick stand of slender, unbranched stalks, growing usually to a height of 6 to 10 feet.