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Experimental Crop Notes, 1895.

BY C. F. CURTISS.

In pursuance of the policy of testing leading varieties of grasses, forage crops and grains and the best methods of cultivation and cropping, the following notes are submitted as the result of the past season's work.*

WINTER WHEAT.

Extensive variety tests of winter wheat have in times past been conducted at this station and the result reported in previous bulletins. The only variety of winter wheat thus far found to be adapted to this locality is the Turkish Red. The yield of this variety has not been less than twenty-five bushels per acre on the experiment station grounds and in 1894 and 1895 the yield reached 48 and 54.7 bushels respectively. The yield of winter wheat, has invariably exceeded that of the spring wheat grown here and the quality has been uniformly better.

THE PRESS DRILL.

The crop harvested the past year was sown Sept. 21, 1894 on some vacant garden ground. The ground was plowed, disced and harrowed twice just prior to sowing and one plat 105x400 feet was sown with a press drill and an adjoining plat of equal size sown with a force feed drill both at the rate of one and one-fourth bushels per acre covered four inches deep. Though the soil was rather dry at time of seeding the seed germinated well and both plats presented a satisfactory appearance at the beginning of winter. In the spring both plats appeared to have wintered badly and did not give prom.

*Considerable data concerning various crops is withheld for verification of results or additional investigation.
ise of a good crop. The winter conditions were adverse to wheat growing, but the season following was very favorable and the crop came out remarkably well considering the condition in which it came through the winter. This variety of wheat possesses unusual vitality and greater power of recuperation after the injurious effects of winter than any other that has yet been tested here, and it often makes a good yield after looking very unpromising at the opening of spring. As the season advanced the wheat improved rapidly and the field at harvest time presented a fine appearance and heavy growth. The treatment of the two plats was uniform throughout with the exception noted in the kind of drills used in seeding; and after threshing it was found that the pressed drilled wheat had yielded at the rate of 54.7 bushels per acre and the force drilled at the rate of 44 bushels per acre. The wheat was of uniform quality, a small hard berry and tested 61.8 and graded "No. 5 White." Mr. F. N. Fowler, local manager for the B. A. Lockwood Grain Co., tested and examined the wheat and said it would bring the top price on the Chicago market. This is a repetition of a similar test made in the crop of 1894 in which the press drill gave a yield of 48 bushels per acre and the common drill 30 bushels. The comparison has in both cases been decidedly favorable to the press drill, and while the condition of the wheat during the winter and spring does not indicate any apparent advantage, the press drilled wheat seems to possess more vitality than that drilled by the other method and this advantage becomes more marked as the crop approaches maturity.

It is only lately that winter wheat growing has been taken up in this section of the state, and but very little is yet grown here though the results of wheat growing on the experiment station grounds since 1891 (with the exception of 1893 when the ground was too dry for germination of seed the preceding fall) has been satisfactory enough to warrant a much larger acreage and it is probable that winter wheat might be much more extensively grown in this state than it now is, though it may not withstand the winter in all localities.

The crop here reported was grown on ground from which a crop of potatoes had been removed in time for fall seeding,
and the same rotation was pursued last fall for the present years' wheat acreage which is now in promising condition. The 1894 crop was grown on a field following oats and vetch. All of the foregoing was seeded east and west after thorough preparation of the soil and no treatment or work of any kind done after seeding until harvest time.

**VARIETIES OF OATS.**

The prevailing difficulty in growing oats in this locality is the tendency of the straw to grow too rank and lodge badly before maturity. This difficulty is common in varying degree to all varieties that we have tested though those of tall heavy straw are most likely to go down, particularly when grown on strong land. During the past season various fertilizers were tried at the station to note the effect on character and stiffness of straw. Ten plats of 1-16 of an acre each were measured in a good even field of Lincoln oats, and on the first five plats muriate of potash, land plaster, lime, salt, and wood ashes were applied at the rate of 320 pounds per acre respectively and on plats adjoining of equal area and uniform crop and soil conditions, the same fertilizers were applied at the rate of 640 pounds per acre. It was thought that possibly the fertilizers containing large amounts of potash would give increased stiffness to the straw and cause the crop to stand better. Observations were taken during the growing season and at time of cutting the condition of all plats was carefully noted with the result that no apparent difference was found in favor of or against any of the fertilized plats compared to those not treated. All of the field lodged badly. The treatment thus far, in applying fertilizers to overcome the tendency of oats to lodge on our strong soils is not satisfactory.

The varieties grown on the station grounds the past year were the Lincoln, Calgary Gray, White Superior, Black Russian, Buckbee's Illinois, Clover and Golden. An extensive test was not attempted but merely a few of the most promising varieties were selected and grown to afford a comparison as to yield, stiffness of straw, and quality of oats. The seeding was done on the third and fourth days of April. The ground occupied had been in corn the previous year and was first cultivated crosswise of the rows; the oats were then sown.
with a broadcast seeder at the rates given in the table and harrowed once, following which 20 pounds per acre of timothy and clover were sown and disc'd in and then given a final harrowing. The table herewith presents a record of the yield per acre and other data relating to the several varieties sown.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Date of Seeding</th>
<th>Bu. of seed per acre</th>
<th>Date of harvesting</th>
<th>Bu of grain per acre</th>
<th>Wgts. of grain per measured bu.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lincoln</td>
<td>April 3</td>
<td>2 1/2</td>
<td>July 18</td>
<td>65.6</td>
<td>22</td>
</tr>
<tr>
<td>Calgary Gray</td>
<td>3 1/2</td>
<td>17</td>
<td>108.3</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>White Superior</td>
<td>3 1/2</td>
<td>17 1/2</td>
<td>96.2</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Black Russian</td>
<td>3 1/2</td>
<td>17</td>
<td>130.4</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>B's Illinois</td>
<td>3 1/2</td>
<td>17</td>
<td>71.5</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Clover</td>
<td>4 1/2</td>
<td>15</td>
<td>58.4</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Golden</td>
<td>9 1/2</td>
<td>10</td>
<td>150.1</td>
<td>36 1/2</td>
<td></td>
</tr>
<tr>
<td>Calgary Grey</td>
<td>3 1/2</td>
<td>17</td>
<td>87.5</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

It will be seen that some of the yields are very large, the highest being the Golden. This variety was not grown under the same conditions as the others and was not originally included in the comparison, but on account of its promising qualities it is here reported, though its history is not known and it was introduced in our experiment in an incidental way. All varieties except this were grown in plats of about an acre each and the yield calculated by exact measurements and weight of grain, but the Golden was only grown on a limited area, 25x400 feet and on soil that had grown a crop of turnips the previous season. The crop was in all respects very superior. The growth was strong and heavy and stood perfectly. One side of the plat was bounded by a roadway and the other by a piece of spring rye of light growth and it is probable that the oats under the conditions prevailing made a somewhat heavier yield than would have been made under ordinary field conditions. The oat crop of 1895 in this state was one of phenomenal yield and excellent quality. The yield of the Golden oats as they came from the machine was 117.2 bushels per acre and they weighed out 41 pounds per bushel machine measure making 150.1 bushels by weight. All yields are here calculated by weight.

The Black Russian ranked next in yield to the Golden, and the Calgary grey next. Both of these are colored oats of rather short straw and stand quite well though they lodged to some extent. The ground upon which all of these oats grew...
was clay loam strong in fertility and in a good state of cultivation. The Calgary Gray though a small grained oat did better when sown at the rate of 2 ¼ bushels per acre than at 2 bushels and it is probable that the Clover oat would have done better if it had been sown heavier. The Lincoln and Illinois oats would have given a heavier yield if the crop had not gone down so that a part of it could not be saved. The most promising of these varieties will be grown again this season along with others for further study and comparison.

The stand of clover was perfect except when the oats lodged.

**CORN.**

It has been our custom to test and improve by selection and good cultivation some of the leading varieties of corn best suited to this locality. The object sought has been to develop as large an ear as will ripen with certainty under Iowa conditions, at the same time looking to uniformity of type, straight even rows, deep kernels, well carried out to the tips, and firmly set on the cob; giving a solid deep grained well shaped ear of bright yellow color, and a stalk of medium or large size uniformly bearing one or more good ears. These characteristics are possessed in a good degree by several of the following varieties.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Bushels per Acre</th>
<th>Shelled corn to 70lb of ears</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa Gold Mine</td>
<td>59.5</td>
<td>60.5</td>
</tr>
<tr>
<td>Legal Tender</td>
<td>64</td>
<td>55</td>
</tr>
<tr>
<td>Early Yellow Rose</td>
<td>85.2</td>
<td>62</td>
</tr>
<tr>
<td>Mortgage Lifter</td>
<td>70.2</td>
<td>59</td>
</tr>
<tr>
<td>Nickel Plate</td>
<td>107</td>
<td>59</td>
</tr>
<tr>
<td>Stanners Yellow Dent</td>
<td>79.3</td>
<td>56.5</td>
</tr>
<tr>
<td>Capital</td>
<td>59.5</td>
<td>60</td>
</tr>
<tr>
<td>White's Mammoth Red</td>
<td>47.1</td>
<td>56.5</td>
</tr>
</tbody>
</table>

The test that we have been able to make during the past season is not as extensive as we would like, but the varying yields and characteristics of these varieties is of considerable interest. All of the varieties reported were grown in plats of an acre or more each. The Capital, Mortgage Lifter, Legal Tender and Yellow Rose were grown on fall plowed meadow land and the Gold Mine, Stanners Yellow Dent and Nickel Plate on fall plowed land that had been in potatoes the previous year. This ground though in good condition was hard-
ly as suitable for making a heavy yield as that on which the other varieties grew. All of these with the exception of the Nickel Plate are deep yellow corns. The Nickel Plate is a pale yellow. This and the Yellow Rose, the two heaviest yielding varieties are very rank growers and develop heavy stalks. The Nickel Plate grows tall though hardly as large in stalk as the Yellow Rose. Both have ears rather above medium size and very firm and heavy. The Nickel Plate grows two ears on a larger percentage of stalks than any other variety we have tested. There are some objections to it. The color is not as acceptable as a richer yellow, and the ears are not as uniform in type as desirable.

The Gold Mine grows the smallest stalk of any of the foregoing varieties and the ears are also a little smaller than the others though very firm and of excellent quality. The Capital and Mortgage Lifter are good varieties of medium sized good shaped ears and deep grain. The former we have grown on the station grounds for several years. It has made as high as 96 bushels per acre here and considerable has been sent out for seed always with entire satisfaction, so far as is known, though it is probable that the Mortgage Lifter is the better yielder. All varieties were tested by taking about half an acre out of the middle of the plat and measuring the ground and weighing the husked corn in November at 70 pounds per bushel. The percentage of shelled corn per bushel was determined in December.

The Mammoth Red corn made a very satisfactory growth and would have given a heavier yield than is here reported had it had the same chance as the other varieties. This corn was grown on another part of the grounds to prevent mixing and the plat was seeded to winter wheat by driving between the rows with a one horse grain drill, Aug. 29th. At that time the corn was leaning somewhat and some stalks were broken off. Following this the corn was put in shock before the ears had fully matured instead of allowing it to ripen on the stalk as did the other varieties. The red corn ripens fully a week earlier than any of the yellow corns tested this season and greater drouth resisting power is also claimed for it though we have not yet tested this feature. The yellow
corns here reported all ripened in ample time and are probably safe varieties under good cultivation in an ordinary season.

RESTORING PASTURE.

The maintenance of pasture lands has become one of the important problems in connection with farm management. Our system of close grazing followed by periods of prolonged drouth inevitably leads to weakened vitality of grass plants resulting in deficient stand and reduced productiveness. Plants like animals require nutriment for growth. Starving has the same effect in either case. In the spring of 1893 as soon as the frost was out of the ground three plats of 1-10 acre each of shallow, gravelly soiled blue grass pasture on the college farm were fenced off and treated as follows:

Plat No. 1 remained as it was except that it was fenced to keep stock off. Plat No. 2 had one quart of medium red clover seed sown on and disced in well. Plat No. 3 had 4,000 lb of fine rich barnyard manure evenly spread on.

These plats were adjoining, on the same kind of soil and subject to the same conditions until July 18th, when the grass upon them was cut and separately weighed with the following results:

Plat No. 1......230 lb of dry well cured hay.
Plat No. 2......380 lb " " "
Plat No. 3......400 lb " " "

Clover seed disced into blue grass pasture at the rate of ten quarts per acre increased the yield 65 percent, the equivalent of 1,500 lb of cured hay per acre. Good fine barnyard manure applied to blue grass pasture at the rate of 20 tons per acre increased the yield 74 percent, equivalent to 1,700 lb of cured hay per acre.

A similar test was made during the past summer except on richer soil and better grass land. Four plats of one-tenth of an acre each were selected and fenced off from a permanent bottom land blue grass pasture, care being taken to have all of them as nearly equal in grass producing capacity as possible. The four together formed an area of 8 rods square. April 23, three pounds of clover and timothy seed mixed in equal parts were sown on Plat No. 1 and the ground disced
twice and harrowed twice afterward. May 1st, 50 pounds of land plaster were applied on the surface of Plat No. 2 and on the same day 400 pounds of liquid manure, diluted and half were applied on Plat No. 3. Plat No. 4 had no treatment. All were subjected to the same conditions during the summer. On August 18th, the grass was cut on all plats and after curing and remaining in the cock until August 12 was hauled in and weighed with the following results:

Plat No. 1 (timothy and clover seeding) 325 pounds.
Plat No. 2 (land plaster) 195 pounds.
Plat No. 3 (liquid manure) 310 pounds.
Plat No. 4 (no treatment) 245 pounds.

The liquid manure before diluting was analyzed by Dr. Weems and found to contain:

Nitrogen, 7 pounds per 1,000.
Potash, 1.67 pounds per 1,000.
Phosphoric acid, .33 pounds 1,000.

The diluted fertilizer thus contained one half of the above amounts of fertilizing matter.

The addition of 30 pounds of grass seed per acre together with the discing and harrowing, increased the yield of grass 32.6 percent or the equivalent of 800 pounds of hay per acre.

The application of liquid manure at the rate of 4,000 pounds per acre increased the yield of grass 26.5 percent, equivalent to 650 pounds of hay per acre. Observations will be taken on the condition and production of these plats during the coming summer to note the continuation of the benefit resulting from fertilizing grass lands. At this rate 80 tons of liquid manure applied to a 40 acre pasture will increase its grass producing capacity 26.5 percent or cause it to grow 12 tons more hay the first year, and based upon these results, clover disced into 40 acres of thin soiled blue grass pasture will increase its grass producing capacity 65 percent, or cause it to produce 30 tons more hay. The inference seems warranted from the foregoing results that the grazing capacity of many pastures may be fully doubled by liberal top dressing or by the use of clover seed and the disc and harrow. The bottom land treated in the last experiment was already good pasture before anything was done with it, and it had not been overstocked. The upland pasture was naturally a poor piece of land though
it was in good condition and the stand of blue grass was good in both cases and all of the plats were practically free from weeds. In the practice of treating pastures with clover seed and the disc, the work can be very much reduced by applying the seed early while the ground is soft in order that a part of it may be covered by the tramping of stock, and the discing and harrowing should also be done at a time when the surface will be most readily loosened. It is probable that half of the above amount of grass seed or less if clover alone is used will give good results.