THE WEED SITUATION.

By A. L. Stone.

The permanence of profitable agriculture in Wisconsin is being seriously threatened by the rapidly increasing spread of weeds, noxious and otherwise. Weeds are active agents in profit reduction in several ways; they absorb plant food and moisture which otherwise would be available for crop use; they are hardier, grow more rapidly, usually have greater leaf expansion and so crowd, shade, and dwarf the cultivated crop. Many weeds are poisonous when eaten by live stock and cause losses of thousands of dollars annually. Many weeds act as hosts for the fungous diseases such as smuts and rusts. Thus the treatment of seed grain for smut proves effective for but two or three years at the best, causing additional expense in labor and material for a repetition of the treatment. Largely increased expense in harvesting and curing cereal or forage crops is engendered by the presence of weeds in additional wear and tear on machinery, twine for binding, and labor for curing. The quality or grade of grains or hay grown under weedy conditions is greatly reduced. Grain is docked in the markets for weed seeds present, the dockage being proportional to the amount of weed seeds. Hay containing weeds like Canada thistles or similar weeds is also graded low. Weeds have a toxic effect on the soil, strongly affecting many grain crops following and thus reducing yields. Finally, the annual cost of controlling weeds by the usual methods of cutting, digging, and cultivation is an enormous tax on the farms of the state.

Just how great is the annual profit reduction from all these causes is impossible to accurately or definitely determine. The
gravity of the weed problem has become so great that there is pressing need of actual facts which may be used to convince the farmer. The farmer is by nature conservative, his life and vocation making him so. His life is strenuous and he will be far more like to take time to consider the weed problem, if it be demonstrated that this will be profitable to him.

In dealing with the weed problems there are two necessary lines of action, viz., eradication of the weeds already existing and prevention of further introduction. To successfully attack the first phase of the problem, it is necessary to present convincing proof of its necessity as has been stated once before. In an attempt to obtain adequate and convincing data the agronomy department has co-operated with members of the Wisconsin Experiment Association. For two years data have been collected with the following results.

RESULTS OF WEED INVESTIGATIONS.

Wisconsin Experiment Station and Association.

1. Total number of reports received............................................................... 499
2. Number of counties from which received................................................... 57
3. Average size of farms in acres.................................................................. 167
4. Total cost of weed eradication.................................................................... $111,134 23
5. Total amount of town taxes on farms.......................................................... 27,362 42
6. Average cost of weed eradication.............................................................. 38.83
7. Average amount of tax................................................................................. 69.08
8. Adjusted value of weed infested farms per acre........................................... 53.12
9. Toublesome weeds in order of numbers:
   Quack Grass—No. Reports........................................................................... 228
   Canada Thistle—No. Reports......................................................................... 362
   Wild Mustard—No. Reports........................................................................... 112
   Sow Thistles—No. Reports........................................................................... 81
   Burdock—No. Reports.................................................................................. 72
   Yellow Dock—No. Reports............................................................................ 115
   Cockle Burr—No. Reports............................................................................ 31
   Snap Dragon—No. Reports............................................................................ 26
   Ox-eye Daisy—No. Reports........................................................................... 14
10. Average area of Canada Thistles in acres.................................................... 5.6
    Average area of Quack Grass in acres...................................................... 3.32
    Average area of Mustard in acres............................................................. 20.50
11. Average per cent of pasture spoiled by weeds.......................................... 5.48
12. Number of farmers willing to assist in enforcing better weed and seed laws............................................................................................... 443

The total cost of weed eradication on the 499 farms above reported, upon was nearly one-half the amount paid as taxes for the support of public institutions; and this does not include the cost of cultivation necessary to control weeds in cultivated crops, like corn, potatoes and sugar beets. Although information on
the latter point was asked in almost no instance was it furnished. Of the 499 farmers 228 report quack grass with average area of 3.52 acres; 262 Canada thistles with an average of 5.6 acres; 112 wild mustard with an average of 20.5 acres per farm; and other weeds in gradually lessening areas. In the farms reported upon in one block of eight counties in the northeastern part of the state where the average area was 129 acres an average area of 35 acres of noxious weeds per farm was reported. Beside damage to cultivated crops these 499 farmers report 5.48 per cent of their pastures as lost because of weed growths.

WEED CENSUS.

In addition to the co-operative work with the experiment association, the agronomy department of the university conducted a careful weed census in five somewhat widely separated counties of the state. This work consisted of a farm to farm canvas of as large a portion of each county as could be covered in the time at disposal of the department for the purpose.

The counties were selected as typical sections of the state and the results of the census are given in the following table:

<table>
<thead>
<tr>
<th>County</th>
<th>No. of farms</th>
<th>Total area</th>
<th>Av. area of farm</th>
<th>Total weed infested area</th>
<th>Av. area of weeds per farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eau Claire</td>
<td>17</td>
<td>3.280</td>
<td>183.0</td>
<td>516.0</td>
<td>30.3</td>
</tr>
<tr>
<td>Iowa</td>
<td>137</td>
<td>22,478</td>
<td>164.0</td>
<td>1,360.77</td>
<td>10.1</td>
</tr>
<tr>
<td>Langlade</td>
<td>76</td>
<td>6,086</td>
<td>80.0</td>
<td>137.12</td>
<td>2.77</td>
</tr>
<tr>
<td>St. Croix</td>
<td>130</td>
<td>24,832</td>
<td>179.4</td>
<td>582.39</td>
<td>4.46</td>
</tr>
<tr>
<td>Sheboygan</td>
<td>44</td>
<td>4,819</td>
<td>110.2</td>
<td>440.75</td>
<td>9.08</td>
</tr>
<tr>
<td></td>
<td>404</td>
<td>60,025</td>
<td>145.3</td>
<td>3,073.03</td>
<td>11.34</td>
</tr>
</tbody>
</table>

From this table it appears that four hundred and four farms were examined including a total area of 60,025 acres, of which 3,073.03 acres of 11.34 acres per farm was seriously infested with noxious weeds. It is noticeable that the weed areas per farm are much larger in some sections than others due to variation in length of time for which agriculture had been established and for various other causes. Whatever the cause, there is op-
portunity to prevent introduction and spread of noxious weeds in these localities, where at present the area is small.

**TABLE III.—IDENTITY AND AREA OF THE WEEDS IN THE VARIOUS COUNTIES.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Acres</td>
<td>Acres</td>
<td>Acres</td>
<td>Acres</td>
<td>Acres</td>
</tr>
<tr>
<td>Eau Claire</td>
<td>50.0</td>
<td>432.00</td>
<td></td>
<td></td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>Iowa</td>
<td>53.2</td>
<td>388.92</td>
<td>665.42</td>
<td>24</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>St. Croix</td>
<td>20.4</td>
<td>52.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheboygan</td>
<td>402.5</td>
<td></td>
<td></td>
<td>38.25</td>
<td>5</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>485.1</td>
<td>1,372.93</td>
<td>665.42</td>
<td>38.49</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

It will be seen that in Iowa, Eau Claire and St. Croix counties, quack grass composes the largest portion of the weed infested area; in Sheboygan county, Canada thistles, and in Iowa county charlock or wild mustard. Other data gathered from the experiment association reports, indicate that Canada thistles are most troublesome along the Lake Michigan shore and adjoining counties, quack grass throughout the north central and northern portion, sow thistles through the central portion and mustard in the northeastern and southwestern portions of the state.

This study of weeds summarized above as related to farm profits, etc., show the extreme gravity of the situation. The study will be continued but the data already obtained lead to some definite conclusions.

First.—Noxious weeds are present in large areas in many sections of Wisconsin.

Second.—They are rapidly being introduced into new sections.

Third.—They cause serious loss wherever present.

Fourth.—Some immediate action should be taken in the way of preventive and remedial measures.

Preventive measures must take into account two principal methods of weed introduction.

(1) Many weed seeds are carried from weedy areas to uninfested farms by such agencies as wind, wind and snow combined,
water in streams or spring freflets, by animals in the fur or
the droppings, and by human beings on the clothing. Instances
are known where Canada thistles, quack grass and other nox-
ious weeds have been carried many miles by the first three of
the above mentioned agencies. This could not have occurred
had not some one carelessly permitted the seeds or roots of these
weeds to remain in such locations and in such condition as to
allow their roots or seeds to be thus distributed.

Noxious weeds ought never to be allowed to stand in the fields
and along fence rows where the plants may mature their seeds
for the wind and water to carry to "pastures new." Such a
sentiment must be created that a farmer would no more permit
noxious weeds to seed than he would poison his neighbor's stock
or burn his buildings. It ought to be considered only slightly
less criminal. Laws, properly enforced, would be of some as-
sistance and this phase will be considered more in detail a little
later.

(2) The weeds which are most pernicious are those which
have been introduced into Wisconsin largely in importations
of agricultural seeds. Any labor expended in weed eradication will
avail little as long as farmers persist in sowing seed containing
the seeds of noxious weeds.

The gravity of the situation seems to have been recognized
by members of the state legislature in 1909 for a law was passed
establishing a state seed inspection division at the experiment
station. This law requires that all field seed sold in Wisconsin
be labeled with the per cent of purity and actual germination
test of the seed contained in all packages over one pound in
weight. The enforcement of the law was entrusted to the ex-
periment station under the supervision of the director. As a
result a total of 1813 official tests were made by the seed in-
spection division of the agronomy department, during the year
beginning July 1st, 1909, and ending June 31st, 1910. Of these
1886 tests were made for seed dealers and the remainder
for farmers. The fact that farmers were able to buy tested seed
from their dealers greatly decreased the number of samples of
seeds sent in by the farmers.

Grains, clover and timothy seed composed the bulk of the
samples tested, complete tests being made on 271 cereal, 520 red
and mammoth clover, 301 alsike clover, 430 of timothy and 97
alfalfa, a total of 1619 samples. Of this number 36 samples or 2.22 per cent were condemned because they contained the seeds of noxious weeds. Unfortunately the law does not require a statement from the dealer as to the quantity of any given lot of seed he may have similar to the sample tested. For this reason it is impossible to make an exact statement of the amount of the noxious weed infested seed which was kept off Wisconsin farms. The quantity was undoubtedly large enough, however, to make the results of inspection extremely valuable. Had the noxious weed seeds contained in the above listed field seed been sown it is hard to estimate the tax in reduced crop production and in cost of weed eradication, which would have resulted.

The seed inspection law with its accompanying educational campaign will undoubtedly be able to cope with this phase of the preventive work.

REMEDIES.

Any remedial measures are liable to failure which are not supported to a large extent by public opinion. The first step then is to educate the farmers concerning the actual harm which is being done and the consequent loss of profit. This is being done as rapidly as possible by the agricultural college, in its extension work and by the experiment station in its demonstrational work as well as through the publications of both. But this line of effort reaches but a small proportion of the farming population. What else can be done?

In the first place the subject must be properly presented in the public schools, particularly those situated in rural sections. The pupils in those schools must have this interest aroused in the subject and this will be comparatively easy if the teacher has the right spirit and the material with which to work. It devolves upon some department of our educational system to supply the necessary material.

The child has lived among weeds all his life but has never realized their economic importance, has known the names of but few of them and has never associated the weed and its seeds. The country teacher likewise is lacking in knowledge to adequately present the subject in an interesting and instructive manner.

To meet the difficulties there should be placed in every school 5—C.
library in the state a publication containing reproductions in actual colors of the most common and noxious weeds with which the farmers have to contend. Such a book should also contain plates showing the seeds of these weeds in their natural colors and with the characteristic markings. Such a publication has already been issued by the Canadian department of agriculture at a cost of a trifle over one dollar per copy. The book contains seventy-five plates with all necessary information concerning the habits of the plant and methods of eradication. Such a book should be published in Wisconsin.

The U. S. Department of Agriculture puts up two cases containing one hundred vials of seeds each, primarily for educational institutions. One of these cases contains one hundred samples of weed seeds the other one hundred samples of seeds of economic plants. These sets of seeds are furnished free to schools.

Supplied with the above named illustrated text and the seeds of the weeds an energetic teacher can easily arrange a series of exercises in which children will be greatly interested and every school be made a point from which the war against weeds may be prosecuted. Weeds which are troublesome on the home farms may be brought to school. Collections of weed seeds may be made and exercises arranged to associate the weed and its seeds. There is no surer and better way of reaching the parents than through the children and those engaged in pedagogical work well know the crying need at present is the publication of a satisfactory text for the use of teachers. The agronomy department stands ready to supply material for such a work but finds no funds available. An edition of at least twenty-five thousand copies of such a book would be none too large to supply the demands of educational institutions, libraries, etc. These plans if executed would give at least a working basis for attacking what what is rapidly becoming one of the most serious agricultural problems.

There are some men, however, who cannot be reached by a campaign of education particularly if they are living upon rented farms and have no interest in the farm beyond the one or two years which they expect to spend there. Such men must be treated in a different way so it is probable that education must be supplemented by wise laws, properly enforced.
There are laws upon our statute books which require that all noxious weeds be prevented from seeding and weed commissioners are appointed in each township, village, or city ward to see that the laws are enforced. The law is practically a dead letter because it calls upon local officials whose action will arouse the antagonism and possible enmity of his neighbors if he attempts to see that the law is enforced.

The present laws are neither wise nor efficient. They should be amended in such a manner as to allow of no possible misinterpretation. Their enforcement should be placed in the hands of a state weed inspector who should have power to appoint subordinate inspectors similar to those in the employ of the Dairy and Food Commission. Men should be appointed who have no interest in any special community but who will see that the laws are enforced without fear or favor and without respect to person or influence. They must be men with a knowledge of weeds, their habits and a practical knowledge of the necessary and most economical remedial measures.