

THE CONTROL OF WEEDS ON A TYPICAL PRAIRIE FARM¹

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This paper is concerned with the control of weeds on a typical prairie farm in west central Illinois, called "Prairie Farm" in this report.

"A weed is a plant out of place." This definition includes not only the typical forms, but also those that under certain conditions are grown as valuable crops but when found with other crops are detrimental. Any plant able to grow successfully with crop plants may be looked upon as a potential weed.

Perhaps half of our most noxious weeds are those introduced from foreign countries. In Europe, for example, where the soils have been intensively cultivated for centuries, only those weeds that are extremely hardy are able to endure the conditions of cultivation and grow successfully with crops. When seeds of these crops were brought to America where large farms with much waste lands were abundant and cultivation was often less intensive, the foreign weeds accompanying the crop seeds were able to thrive.

Tehon ('37) discusses the reasons why certain weeds in Illinois are classed as pernicious and widespread control measures are needed. He

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states the conditions under which these weeds do the most damage, the ways in which weeds cause injury, and discusses methods used to control them. However, it is to be noted that none of the thirteen weeds listed by Tehon as the most noxious in Illinois is included in the list of the seven worst weeds on Prairie Farm.

Wilson ('44) has made an analysis of the control of noxious plants. He lists the following characteristics of weeds considered as noxious:

- (a) Persistence and vigor of growth.
- (b) Poisonous properties of herbage or fruits.
- (c) Possession of spines or thorns injurious to animals.

DESCRIPTION OF PRAIRIE FARM

The farm chosen for this study consists of 161 acres of gently rolling, rich prairie land situated five miles south of Adair in Eldorado Township in west central Illinois. Most of the soil is brown silt loam with a few small areas of black silt loam. The entire farm is very fertile so that weeds as well as crops grow luxuriantly.

The present owner acquired the farm in 1941 and immediately began laying out the fields as shown in Fig. 1. There are no division fences on the south 80 acres; permanent markers on both the north and south edges divided this part into three equal fields. The other fields are di-

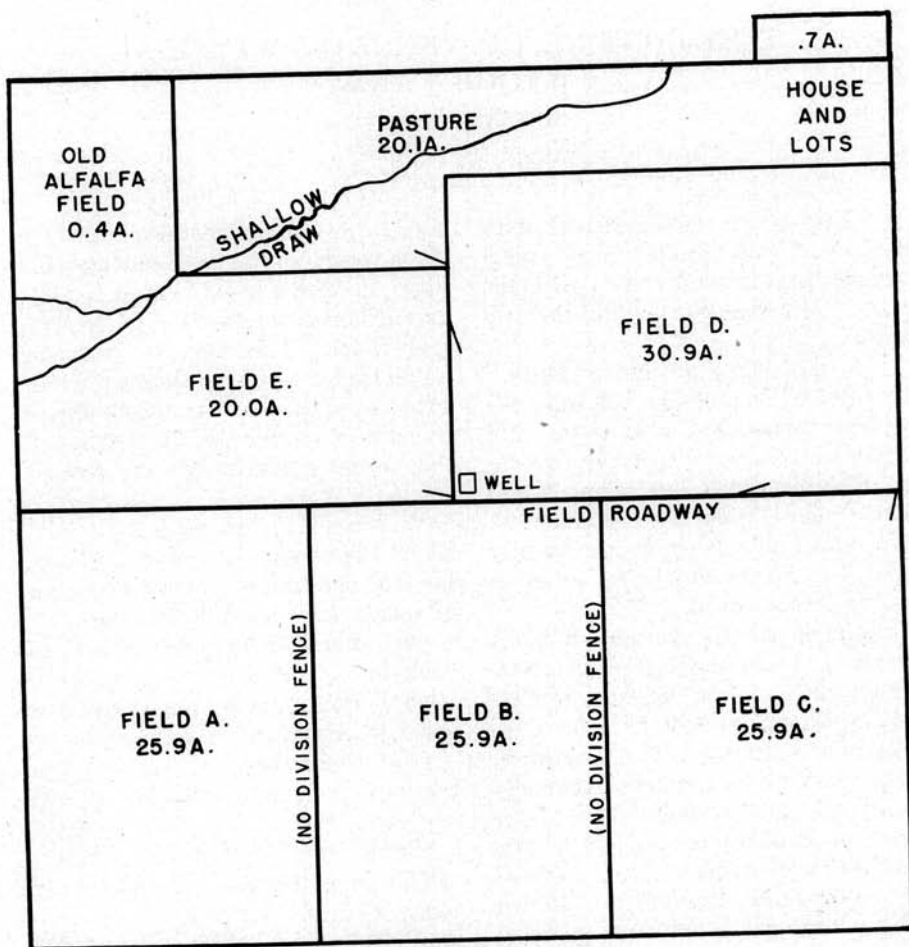


FIG. 1.—Plot plan of Prairie Farm.

vided by permanent fences with gates as shown in Fig. 1. Drainage tile run from all the low places to a ditch which passes through the northwest corner of the farm. There is a flow of water in the ditch during the entire year.

GENERAL METHODS

In order to analyze the program of weed control used on Prairie

Farm, approximately 150 weeds on the farm and in the general vicinity were collected, classified, and pressed for a permanent record. Frequent visits were made to the farm during the years 1943 to 1945 for observations. Conferences were held with the tenant and owner concerning procedures and results. Photographs were taken to record significant conditions and changes.



FIG. 2.—A field just across the fence from Prairie Farm. It illustrates conditions in 1941.

CHANGES BROUGHT BY THE CONTROL MEASURES USED

PRAIRIE FARM AS IT APPEARED IN 1941

When the farm was purchased there was no doubt of its fertility, but its productivity was low in everything except weeds, which were everywhere. All fields were badly infested. Weeds were along the fences, in the rows and in between the crop rows. Figure 2 illustrates the condition of some of the fields.

The seven most noxious weeds are listed in table 1.

Immediately upon acquiring the farm, the new owner began a definite system of crop rotation. This

usually consisted of corn; soy beans; oats and clover. Modifications were made if clover or other crops failed. An intensive program of weed eradication and control was also started.

At all times much attention was given to clean farming. Weeds were destroyed before seeds could mature; in the corn fields with a hoe, in soy beans by pulling, and in clover and oats by cutting at harvest time.

The seven most noxious weeds (table 1) can be divided into two groups: group "A" consists of milk weed, Indian hemp and hedge bindweed. This group is difficult to control because they grow from under-

TABLE 1.—THE SEVEN MOST NOXIOUS WEEDS ON PRAIRIE FARM

Scientific Name	Common Name
* <i>Abutilon theophrasti</i> Medic	Velvet Leaf
* <i>Amaranthus retroflexus</i> L.	Rough Pigweed
<i>Apocynum cannabinum</i> L.	Indian Hemp
<i>Asclepias syrica</i> L.	Common Milkweed
<i>Convolvulus sepium</i> L.	Hedge Bindweed
* <i>Echinochloa crusgalli</i> (L.) Beauv.	Barnyard Grass
<i>Polygonum pennsylvanicum</i> L.	Pennsylvania Smartweed

All plants were classified according to Gray ('08).

*Indicates that weed is of foreign origin.



FIG. 3.—Field of soy beans in 1945. Not a weed could be found in this field.

ground parts in which considerable food is stored. Group "B" includes the remaining weeds; pigweed, Pennsylvania smartweed, velvet leaf, and barnyard grass. These weeds reproduce by seeds. It was easier to eradicate the weeds in group "B" than those in group "A", but it was more difficult to keep them under control.

The most effective method found for eradication of milkweed and Indian hemp was by pulling the plants and breaking off the stem several inches below the surface of the soil, thus preventing food storage required to promote growth the next year. The hedge bindweed was cut with a hoe for the same reason. In group "B" the weeds were cut in the blossom stage or a little later, thus preventing the maturing of seeds. This cutting had to be repeated several times each year. In addition there was careful preparation of the seed bed and cultivation of the various crops as required.

AFTER FOUR YEARS

In 1945 as a result of the program of eradication and cultivation there were few weeds on Prairie Farm, especially those having underground food storage regions. The milkweed had almost entirely disappeared. It was estimated that there was a decrease of more than 90 percent in the numbers of Indian hemp and hedge bindweed. In a field of rowed soy beans it was almost impossible to find a weed (fig. 3.) Weeds were also much reduced in the corn fields. It required considerable search to locate any hedge bindweed. In 1941 it would have been difficult to find a single corn stalk without bindweed.

It must be noted that it was necessary to continue the weed control measures. In 1945 the tenant failed to cultivate a corn field across the rows and cultivated only twice in the rows during the growing season. The result was a considerable growth of weeds in the rows of corn. These weeds probably came from seeds in the soil, as it has been shown that

weed seeds may survive for many years.

CONCLUSIONS

1. It is possible in a period of five years to eradicate or control many of the noxious weeds of a typical prairie farm in west central Illinois.

2. Control can be accomplished only by carefully planned, intensive work.

3. To maintain control of the weeds it is necessary to continue a planned type of crop rotation and cultivation because one year of poor

cultivation may undo the work of several years.

4. If cultivation is to result in the destruction of weeds, it should begin sufficiently early in their development to prevent their becoming well established.

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