

No plant has been found, so far as known to the writer, producing seed in Indiana." On the other hand, Watts states that under Tennessee conditions each garlic head usually contains about six flowers each of which produces from three to six seeds, and nearly 100 per cent of the seeds are viable and produce mature plants the season following their formation.³

On November 20, 1922, the writer found a number of wild garlic plants in Dubois County, Indiana, that were conspicuous on account of the clusters of flowers formed on each head (fig. 1). An examination of the flowers revealed the presence of seeds, most of which were somewhat shriveled although a number of them were plump and appeared to be viable. A dozen of these heads were collected from which slightly over two hundred seeds were secured.

The seeds were separated into two lots of one hundred each. One lot was tested for germination by the writer, using moistened blotters at ordinary room temperature for the purpose, while the other lot was sent to the Seed Laboratory of the Purdue University Agricultural Experiment Station. Germination tests were conducted for periods of thirty and thirteen days and in neither case did a single seed germinate.

These data suggest that the production of seeds by *Allium vineale* L. under Indiana conditions is very unusual while the formation of viable seeds either does not occur or is rare.

RECENT INDIANA WEEDS, 1923.¹

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This paper attempts to record the occurrence in Indiana of plants known to have pronounced weedy characteristics and which are new in the state or else have recently developed troublesome tendencies. The present paper is a continuation of the record started in the "Proceedings of the Thirty-eighth Meeting (1922) of the Indiana Academy of Science". It covers the period from October 1, 1922, to October 1, 1923.

For assistance in verifying identifications thanks are due Dr. B. L. Robinson, of the Gray Herbarium, Dr. John K. Small, of the New York Botanical Garden and Dr. S. F. Blake of the United States Department of Agriculture. Specimens of the plants listed have been deposited in the herbarium of the Purdue University Agricultural Experiment Station.

Fanweed.—*Thlaspi arvense* L. This is one of the most feared of grainfield weeds in Minnesota, North and South Dakota, Colorado and throughout the grain-growing sections of western United States and Canada. Fanweed is a European annual that is noted for its prolific seed production and is the subject of several western experiment station bulletins.

³ Watts, R. L. "The Wild Onion." Tenn. Agr. Exp. Sta. Bul., Vol. VII, No. 2, 1895, p. 31.

¹ Contribution from the Botanical Department (Extension Division) of the Purdue University Agricultural Experiment Station.

Fanweed (Frenchweed, penny cress, stinkweed) was located during early June in an alfalfa field on the John Danglade Farm in Switzerland County. The infested section of the field was immediately cut and burned and it is hoped that the weed was completely destroyed by this means. The same species was again located during early September on the farm of E. D. Stevenson, Carlos, Indiana, where it was going to seed in a cornfield.

Knawel or German Knot Grass.—*Sceleranthus annuus* L. Knawel is one of the worst of weeds in the trucking districts of Virginia and in other sections of the eastern United States, but the plant is rare in the middle west. The species is not represented in the Gray Herbarium by specimens from Indiana and has previously been reported but once in this state, when it was recorded by Nieuwland at Webster's Station.² Knawel was collected at Shipshewana, Indiana, on July 19, 1923, where it is a weed of scattered occurrence.

Gumweed.—*Grindelia squarrosa* Dunal. Gumweed is a dangerous weed in the wheat fields of the northwest where the gummy parts of the flowering heads remain in the wheat after threshing and impart a disagreeable pine-like odor and flavor to the flour. It is a perennial that is native on the western plains.

The only record of the occurrence of gumweed in Indiana is a single report from Cass County recorded in Coulter's catalogue of Indiana plants. Specimens were received on July 20, 1923, from West Lebanon, Indiana, and one of them was deposited in the Gray Herbarium, which previously contained no record of the occurrence of this species in Indiana.

Yellow Star Thistle.—*Centaurea solstitialis* L. The yellow star thistle is reputed to be one of the most damaging of grainfield weeds in California. The species was located on the farm of Cyrus McGregor, Princeton, Indiana, R. R. 1, where it infested a field of alfalfa. The seeds of the yellow star thistle are difficult to remove from alfalfa and the plant was probably introduced by means of impure seed.

Hoary Alyssum.—*Berteroa incana* DC. Hoary alyssum is said to have been introduced into the United States comparatively recently by means of European red clover seed. On account of its prolific seed production this species is thought to be a dangerous weed the further spread of which should be stopped. The plant is becoming common in New England and New York where it was first noted about thirty years ago.

Specimens of hoary alyssum were received on June 16, 1923, from County Agent C. A. Jackson, of Goshen, with the notation that the plant is a weed on a run-down eighty acre farm in Elkhart County. A small patch of the plant was found by the writer thriving on a vacant lot in West Lafayette, but all members of this small colony were destroyed before seeds ripened.

Hare's Ear Mustard.—*Conringia orientalis* Dumort. This species is of comparatively recent occurrence in the United States. It is said to have been introduced during the early nineties in European flax seed.

² Amer. Mid. Nat., 3:280:1914.

Since then it has developed into a noxious grainfield weed throughout the grain-producing areas of the northwest.

A number of specimens of this plant were received on June 8, 1923, from L. M. Busche, of Decatur, Adams County, Indiana, where the species is apparently established as a grainfield weed.

Miscellaneous.—Among new species found in Indiana that are not known to be noxious in other parts of the United States may be mentioned yellow alfalfa, *Medicago hybrida* (Pourr.) Traut., common along fence rows on the Purdue Farm in West Lafayette, and *Navarretia pubescens*, Hook. and Arn., a number of flowering specimens of which were found in a clover field in Randolph County on August 29, 1923. *Radicula palustris* (L) Moench, of common occurrence on moist land throughout Indiana but not ordinarily considered as a noxious weed, was found to be exceedingly troublesome near Veedersburg.

The Division of Botany of the Purdue University Agricultural Experiment Station will appreciate data regarding the occurrence of new plants in Indiana that are apt to prove troublesome as weeds. Information of this character is particularly valuable when the infested area is small, since an attempt is being made to eradicate potentially troublesome plants before they have had an opportunity to become widespread.

A WEED SURVEY OF INDIANA.¹

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A regional flora, such as Coulter's "Flora of Indiana", records the occurrence of plants but gives little information regarding the degree to which weedy species are troublesome.

In order to secure data of this type a weed survey of Indiana is being undertaken by the Extension Division of the Botanical Department of the Purdue University Agricultural Experiment Station. Three sources of information are being used, (1) the county agent, (2) field observations and (3) the experience of individual farmers, secured from correspondence and by the questionnaire method.

The first step in securing this information was taken during the winter of 1922 when a questionnaire was sent to the county agents in 84 counties of the state. Each agent was asked to give the names of the five worst weeds in his county, and 71 replies were secured. Since the county agent, by the very nature of his occupation, is usually best qualified to give information concerning agricultural matters in his county, it is felt that reliable information was secured by this method. The results are not only of general interest, but have a practical value. They may also be of ecologic interest in present and future studies of the weed problem in Indiana.

The reports from the different counties are shown graphically in figure 1. The county numbers on the map each represent a species

¹Contribution from the Botanical Department (Extension Division) of the Purdue University Agricultural Experiment Station.