

SOME OBSERVATIONS ON THE WEED FLORA OF WYOMING

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No fully satisfactory method has yet been devised for reporting the specific or relative concentrations of plant species over large areas. To date, two general methods of reporting plant distribution have been used. The taxonomic botanists have limited themselves largely to reporting the plants present in a given area or region. Range management workers have used the other method of reporting specific plant stands on small areas.

The procedure used in this study is quite different from the two preceding methods. The data reported here are based upon a survey of plant seeds or impurities found in approximately 1000 seed samples of the 1941 crop, submitted to the Wyoming State Seed Laboratory in 1941-42. It is therefore a study of the weeds found in the cultivated or cropped lands of Wyoming. This method has the disadvantage of being too conservative. About 50 per cent of the samples had been cleaned. The remaining 50 per cent had been partially cleaned, having passed through the threshing machine before they reached the laboratory. We therefore recognize that some of the species of weeds which appeared in the fields might possibly have been completely removed and lost before the samples were submitted for analysis. There is, however, satisfaction in knowing from the outset that the data gathered in a study will be conservative.

The study was started with the object of learning what impurities were more prevalent in the samples, that is—what were the more common weeds? Although the data are specific to the cultivated lands of Wyoming, we can be quite confident that if similar studies are made in other states similar conditions will be revealed.

Many have had the illusion that only

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arvensis, *Centaurea repens* and others. Fortunately, the major cover of the range still consists of the native grasses.

Our study was made to determine what weeds were persisting in the crop lands of that State. We must recall that these cropped lands had only a few years ago been covered with native vegetation. The questions to be answered were these: Were the weeds now persisting, of native or foreign origin? And more specifically, what was the relative distribution or intensity of native and introduced species as weeds?

For brevity in this paper only the species which appeared in two or more per cent of all samples are reported here. The 36 species listed are only about one-tenth of all that were found. The data do not show the degree to which the samples were infested. It instead shows the percentage of samples which were infested by a given weed. No discussion is given to the persistence or description of the plants as weeds. Some conclusions on persistence can be obtained from more detailed observation of the data in Table I since frequency is in direct relation to persistence.

Of the 36 species listed in Table I, 20 are of exotic origin while 16 are native. The 20 introduced species appeared 2,964 times as a total for all samples, while the 16 native species appeared 1,333 times. The ratio of introduced to native species was 1.2 to 1, while the frequency of occurrence of the seeds of introduced species as compared to native was in the ratio of 2.2 to 1. It therefore becomes apparent that our introduced weed species have spread faster and have excelled in their ability to maintain themselves through greater adversity than our native species. A number of the weeds found in this study to be very common and widespread are listed as "sparingly introduced" in the "New Manual of Rocky Mountain Botany" published in 1909. Four other species listed here are not recorded in that manual.

None of the widely recognized noxious weeds appear in Table I because they were so rarely present in seed samples.

Table I
Weed Seeds which Appeared in 2 or More Per Cent of All Seed Samples

| Name of Weed | Per Cent of Samples | Native or Introduced |
|-------------------------------|---------------------|----------------------|
| Annuals | | |
| <i>Panicum capillare</i> | 9.4 | N |
| <i>Echinochloa crus galli</i> | 17.7 | I |
| <i>Setaria viridis</i> | 41.5 | I |
| <i>Avena fatua</i> | 6.5 | I |
| <i>Bromus commutatus</i> | 7.2 | I |
| <i>Bromus tectorum</i> | 13.1 | I |
| <i>Polygonum aviculare</i> | 11.4 | N |
| <i>Polygonum convolvulus</i> | 11.3 | I |
| <i>Chenopodium album</i> | 43.2 | I |
| <i>Atriplex</i> species | 13.5 | N |
| <i>Salsola pestifer</i> | 48.6 | I |
| <i>Kochia scoparia</i> | 20.2 | I |
| <i>Amaranthus blitoides</i> | 6.2 | N |
| <i>Amaranthus retroflexus</i> | 28.7 | I |
| <i>Thlaspi arvense</i> | 8.3 | I |
| <i>Erucastrum Pollichii</i> | 2.8 | I |
| <i>Lepidium apetalum</i> | 4.6 | I |
| <i>Conringia orientalis</i> | 3.7 | I |
| <i>Camelina microcarpa</i> | 3.4 | I |
| <i>Brassica arvensis</i> | 3.5 | I |
| <i>Brassica juncea</i> | 8.5 | I |
| <i>Brassica nigra</i> | 3.6 | I |
| <i>Cuscuta</i> species | 5.0 | N |
| <i>Lappula occidentalis</i> | 12.4 | N |
| <i>Salvia lanceolata</i> | 4.7 | N |
| <i>Plantago Purshii</i> | 5.2 | N |
| <i>Iva xanthifolia</i> | 4.6 | N |
| <i>Lactuca scariola</i> | 3.3 | I |
| <i>Helianthus annuus</i> | 26.3 | N |
| Biennials | | |
| <i>Hordeum jubatum</i> | 5.2 | N |
| <i>Cirsium Flodmani</i> | 2.0 | N |
| Perennials | | |
| <i>Stipa viridula</i> | 4.9 | N |
| <i>Oryzopsis hymenoides</i> | 4.3 | N |
| <i>Rumex crispus</i> | 16.7 | I |
| <i>Iva axillaris</i> | 5.3 | N |
| <i>Grindelia squarrosa</i> | 12.9 | N |

The survey showed these noxious weeds to be present in the following frequencies: *Cirsium arvense* .4%, *Convolvulus arvensis* .2%, *Lepidium draba* .2%, *Centaurea repens* .1%, and *Agropyron repens* .1%.

The frequency of these 36 common weed seeds shown in Table I, when compared to the frequency of noxious weed seeds was in the ratio of 429 to 1. Since noxious weeds are so much more destructive than common weeds on a plant for plant basis, this ratio is not a true relation of their importance. Their ratio on the basis of importance would be narrowed considerably.

The question: which are our common weeds, seems adequately answered. There can be no better evidence as to what constitutes weeds than to learn which ones are persisting and which ones have and are proving their tenacity.

The introduced species are our serious weeds today and are destined to become more exclusively the weeds of the future. Only by constant vigil, better cropping methods, and above all else, really clean seed, can we hope to even hold our own. Really clean seed means something more than staying within the

maximum State tolerance of 1, 2, or 3% weed seed. We should instead strive for a weed seed limit of .1% in small seeded legumes, and .01% in the cereals.

The status of the weed distribution in Wyoming less than forty years after the virgin prairie was first plowed and seeded was briefly this: Every field was infested with weeds of both native and foreign origin, with the introduced weeds being represented by a larger number of species, and in greater abundance than the native. Noxious introduced weeds were infesting perhaps a hundred thousand acres but the common weeds were present on over 100 million acres.

This was the condition after 40 years. We might well ponder what the status will be when another 40 years have passed. These same, and much worse, conditions prevail throughout the western states. Therefore, the evidence and the problem presented is not limited to Wyoming but applies to every state in the region. It will require concerted effort on the part of every individual, community, and state to make any improvement of our present status. Without such concerted effort we will have to expect more weeds and, as a result, lower yields with each succeeding year.