



**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques



© 1986

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- | | |
|---|--|
| <input type="checkbox"/> Coloured covers/
Couverture de couleur | <input type="checkbox"/> Coloured pages/
Pages de couleur |
| <input type="checkbox"/> Covers damaged/
Couverture endommagée | <input type="checkbox"/> Pages damaged/
Pages endommagées |
| <input type="checkbox"/> Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée | <input type="checkbox"/> Pages restored and/or laminated/
Pages restaurées et/ou pelliculées |
| <input type="checkbox"/> Cover title missing/
Le titre de couverture manque | <input checked="" type="checkbox"/> Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> Coloured maps/
Cartes géographiques en couleur | <input type="checkbox"/> Pages detached/
Pages détachées |
| <input type="checkbox"/> Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire) | <input checked="" type="checkbox"/> Showthrough/
Transparence |
| <input type="checkbox"/> Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur | <input type="checkbox"/> Quality of print varies/
Qualité inégale de l'impression |
| <input checked="" type="checkbox"/> Bound with other material/
Relié avec d'autres documents | <input type="checkbox"/> Includes supplementary material/
Comprend du matériel supplémentaire |
| <input type="checkbox"/> Tight binding may cause shadows or distortion
along interior margin./
La reliure serrée peut causer de l'ombre ou de la
distorsion le long de la marge intérieure | <input type="checkbox"/> Only edition available/
Seule édition disponible |
| <input type="checkbox"/> Blank leaves added during restoration may
appear within the text. Whenever possible, these
have been omitted from filming./
Il se peut que certaines pages blanches ajoutées
lors d'une restauration apparaissent dans le texte,
mais, lorsque cela était possible, ces pages n'ont
pas été filmées. | <input type="checkbox"/> Pages wholly or partially obscured by errata
slips, tissues, etc., have been refilmed to
ensure the best possible image/
Les pages totalement ou partiellement
obscurcies par un feuillet d'errata, une pelure,
etc., ont été filmées à nouveau de façon à
obtenir la meilleure image possible. |
| <input type="checkbox"/> Additional comments:/
Commentaires supplémentaires: | |

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

tails
du
odifier
une
image

The copy filmed here has been reproduced thanks to the generosity of:

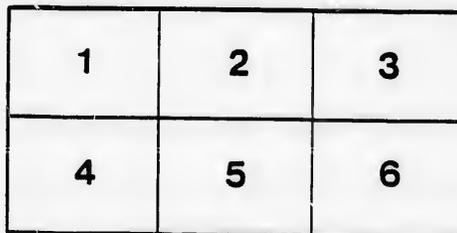
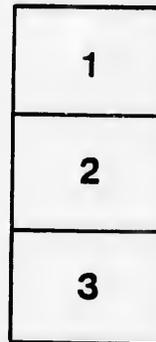
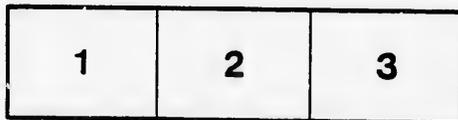
Library
Agriculture Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Bibliothèque
Agriculture Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

rata

elure,
à

2X

EXPERIMENTAL FARM NOTES

No. 4.

CENTRAL EXPERIMENTAL FARM
DIVISION OF BOTANY,
DEPARTMENT OF AGRICULTURE.

THE

RUSSIAN THISTLE

OR

RUSSIAN TUMBLE-WEED.

PUBLISHED BY DIRECTION OF THE HON. A. R. ANGERS, MINISTER OF AGRICULTURE.

OTTAWA
GOVERNMENT PRINTING BUREAU

1894

OB
650.4
C212
no. 4
1894



Fig. 1.



Fig. 2.

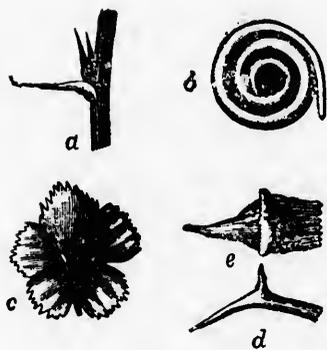


Fig. 3.

Fig. 1.—A branch of a mature plant. Fig. 2.—A young stem showing the nature of the leaves before the flowering period and a single seed enlarged. Fig. 3.—Enlarged details of the prickles, the flower and the seed from which the seed coat has been removed.

THE RUSSIAN THISTLE
OR
RUSSIAN TUMBLE-WEED.

(*Salsola Kali.*, L., var. *Tragus*, D.C.)

Undoubted specimens of this terrible pest of the Dakotas and some of the other North-western United States, having been sent to me from Manitoba, the Hon. Minister of Agriculture deems it advisable that a short circular giving a figure of this plant should at once be distributed amongst farmers in Manitoba and the North-west Territories, so that, as far as possible, they may be made aware of its appearance and nature. He also instructs me to impress upon all the enormous injuries which will surely follow unless every effort is now put forth to eradicate this pest before it becomes firmly established. The United States Government, as well as those of several of the Northern States, have issued some excellent illustrated articles on this subject, and large sums of money, amounting now to nearly \$2,000,000, have been appropriated to secure the eradication of this weed, which is known to have been the cause of so much loss to farmers in Russia and in the United States. The United States Government has issued a bulletin by Mr. L. H. Dewey, Assistant Botanist of the United States Department of Agriculture, illustrated by figures of the plant in its different stages and of the seed enlarged. The Farmer's Advocate, of London, Ont., has wisely published a warning article to Canadian farmers, giving quotations from the above, and reproductions of the figures. The publishers have kindly lent me the figures used in that article for this circular.

These will serve to draw attention to the plant and show those who have not seen the above articles, what its appearance is. It is not a true thistle, but is a variety of the European Salt-wort, and is related to the lamb's quarters and spinach. It takes its name "thistle" from the fact that, as the seeds ripen, the stems develop at each joint three sharp spines instead of leaves. The spines are described as harder than, and as sharp as, those of the Canada

thistle, so that farmers have to wrap leather round their horses' legs when cutting grain infested by it. It has now spread over an area of 30,000 square miles, and is abundant and troublesome over two-thirds of that area. Mr. Dewey says in his bulletin: "In the badly-infested areas more than 940,000 acres are devoted to wheat raising. The average loss on this land, which may be attributed to the Russian Thistle alone, cannot be less than five bushels per acre; and 3,200,000 bushels at the minimum price of 50 cents per bushel (which is considerably less than the average price) indicates a loss to the farmers in the two Dakotas of \$1,600,000. The loss in other crops, the injuries caused by the spines, and the fires caused by the plants jumping fire breaks, will bring the total loss to something more than \$2,000,000 for the year 1892.

"These figures may seem alarming, but they are based on conservative estimates. If they are alarming to the farmers, it is well, for it is only when alarmed that most men will take effective measures to avoid danger."

ORIGIN OF THE WEED.

The above facts pointing out the possible dangers of allowing this plant to become established in Canada were given in the annual report of the Experimental Farms for the year 1893, at page 192, and western farmers were urged to be on the look-out for so dire an enemy. In consequence of that notice I have received a large number of specimens and inquiries concerning noxious weeds.

"The Russian Thistle originated in Eastern Europe or Western Asia. It has been known in Russia many years and has quite a bad reputation in the wheat regions there as it has in the Dakotas. It was introduced in Bon Homme county, South Dakota, about fifteen years ago. There is little doubt that it was first brought in very small quantities in flax seed imported from Europe. The few plants, grown from the foreign seed, grew, produced seed, and increased slowly and almost unnoticed until about six years ago (1886). They were then thoroughly acclimated and naturalized and seem to have partaken of the conquering spirit of the West." (Farmers' Bulletin No. 10, U. S. Dep. of Agr.)

DESCRIPTION OF THE WEED.

Prof. Bessey gives the following description of the plant in Bulletin No. 31, Nebraska Agric. Expert. Station, December 20,

1893: More or less spherical in shape, and consisting of many elongated branching twigs which grow outward and upward from the root. When not quite mature the whole plant has a reddish colour, but as its seeds ripen it bleaches out and eventually is almost white. Well grown specimens are from two to three feet in diameter, but where crowded together they may be much less. Each twig and branch is covered on all sides by hard, stout, prickles, which are very sharp and very irritating to the touch. These prickles are in threes, that is, there are three together in a place, and pointing in different directions. At the upper side of the base of each three prickles there is a seed, and as there are about ten of these to each inch, it is easily seen that the seeds produced by every well grown plant must reach a great many thousands. A calculation made with some care showed that a plant examined contained between ten and fifteen thousand seeds. Late in the fall and in the early part of winter the root breaks off and the plant is free to roll away with its freight of seeds. The young plant which appears in May and June does not suggest to the farmer anything of its final form and harmfulness. It is then a soft, smooth and innocent-looking plant, with narrow fleshy leaves an inch long. Its appearance at this stage is well shown by the small branch (*a*) but when full grown its appearance is like figure 1. This plant blossoms in July and August and its seeds mature in September and October. The seeds are about one-twelfth to one-sixteenth of an inch in diameter, of a dull grayish colour. When the thin covering is rubbed off from them they are seen to have a spiral structure as is well shown at fig. 3*b*."

STEPS TO BE TAKEN TO PREVENT THE SPREAD OF THE PEST.

This is a matter in which every resident as well as every farmer of the West should interest himself, as it is only by all co-operating and destroying the weed wherever found that a successful fight against this great evil can be hoped for.

In the first place let it be understood that the Russian Thistle can certainly be eradicated, if all will co-operate to this end. It is an annual plant and grows from the seed each year. The chief means of distribution is by the wind. During the winter the large plants separate from their roots and becoming "tumble-weeds" are blown across the prairie, dropping their seeds wherever they

go. The young plants are at first soft and weakly, they are easily destroyed with a hoe, plough or cultivator, may be either smothered out entirely by a heavy crop or so weakened as not to grow large enough to form tumble-weeds. The seeds germinate freely after ploughing and unlike those of Wild Mustard and some other plants have not the power of retaining their vitality for several years when covered with soil. Therefore as Prof. Hays of Minnesota points out "If all plants large enough to travel before the wind are kept from ripening, the weed will not be hard to eradicate on each farm.

Waste lands, roadsides, and railway banks should be particularly watched as these are the most likely places for the weed first to occur, and where, undoubtedly, long after the pest has been brought into subjection in arable lands, some plants will grow to maturity unnoticed and unchecked and then will be blown away from these neglected spots and re-infest fields from which the weed had been thoroughly cleared. All infested lands, or lands likely to be infested, should as far as is practicable be cultivated till August, after which time, it is said by those who have investigated this subject in the United States, the Russian thistle will not have time to spring up again and mature seeds.

If it should be found that the seed of this weed fails to ripen in Manitoba and the Territories before harvest, the cutting of the grain followed by early fall ploughing would to a great extent ensure its destruction in the grain fields and thus materially lessen the labour of keeping it in subjection.

All seed-grain must be examined carefully and cleaned thoroughly of all weed seed before sowing.

As all samples may be sent to this Department *free of all charges for postage*, we hope that farmers everywhere who may find specimens of weeds concerning the identity of which they have doubts, will forward them at once to,—The Botanist, Central Experimental Farm Ottawa, for examination and report.

JAMES FLETCHER,
Botanist.

WILLIAM SAUNDERS,
Director.

OTTAWA, August 1, 1894.

