
The Saskatchewan Integrated Noxious Weeds Management Program

G. Bowes

Program Coordinator, Noxious Weeds Management Program, 3830 Thatcher Avenue,
Saskatoon, SK, S7K 2H6

Key Words: scentless chamomile, mapping, biological control, seed weevil, gall midge, right-of-way, *Omphalapion hookeri*, *Rhopalomyia tripleurospermi*

Abstract

The distribution of scentless chamomile was mapped for highways and municipal roads throughout the province. The weed grows on 867 miles of provincial highway and 2814 miles of municipal roads. In Saskatchewan, 98 rural municipalities do not have the weed. Scentless chamomile was reported in 199 rural municipalities. The weed should be controlled to prevent further spread throughout the province.

The scentless chamomile seed weevil (*Omphalapion hookeri*) and gall midge (*Rhopalomyia tripleurospermi*) have successfully established in the province. Their populations are increasing.

Introduction

In April 1999, a 3-year project was started in Saskatchewan to develop integrated control programs for noxious weeds that emphasize the need for biological control.

The objectives of the project were:

- 1) to develop and implement a scentless chamomile awareness and control program and
- 2) to monitor existing biological control releases and make new releases of biological control agents.

The major focus was on integrated weed control for scentless chamomile. The weed is slowly spreading across Saskatchewan. It is becoming an increasing problem in annual crops, forage crops, roadsides, wildlife habitat and specialty crops such as herbs and spices. If scentless chamomile and its spread are not controlled, then the weed will continue to limit diversification opportunities for many producers, lessen the value of forage crops and cause significant economic loss.

Scentless chamomile grows as a summer and winter annual. Successful control in crops depends on controlling both growth forms. The weed is not controlled by many common broadleaf herbicides (e.g. 2,4-D, MCPA, dicamba). The most effective herbicides have soil residual properties and therefore can drastically affect crop rotation options.

Methods

Scentless chamomile distribution

Mapping the distribution of scentless chamomile along road right-of-ways was started in 1999. The purpose of mapping the distribution of scentless chamomile was to find where the weed is growing, estimate the cost of control with herbicides and help rural municipalities decide if they should apply herbicides or hire a herbicide application company. This paper describes the mapping procedure.

Saskatchewan Inventory maps that were prepared by Saskatchewan Highways and Transportation are available in either legal or ledger size for each rural municipality in the province. A copy of the appropriate inventory map was sent to each rural municipality in Saskatchewan.

In 1999, rural municipalities were asked to map the distribution of scentless chamomile that grows along the right-of-ways on their roads and highways within their jurisdiction. The presence of scentless chamomile was marked with a red 'hi-lite' pen. Miles of road right-of-ways for provincial highways and rural municipal roads for each rural municipality were totaled

In 2000, each rural municipality was asked to mark on their Saskatchewan Inventory map with a red 'hi-lite' pen the distribution of scentless chamomile that was found growing along railway right-of-ways, around grain elevators-terminals and along waterways. The name of the railroad company and the portion of the railway where scentless chamomile was growing were marked on the municipal maps. Rivers, streams, drainage channels and other waterways where scentless chamomile was known to grow were marked on the maps.

Each map was scanned and saved in a computer as a jpg file. A copy of the appropriate scanned map was sent to each rural municipality along with a cost estimate for road right-of-way herbicide application. The total miles of municipal road and highway rights-of-way with scentless chamomile were included with each report.

The presence or absence of scentless chamomile was estimated for those rural municipalities that did not return a completed inventory map. First, Extension Agrologists were asked if scentless chamomile grew in the rural municipalities in their district. If an Extension Agrologist was not sure if scentless chamomile was present in a rural municipality, then the appropriate rural municipality office or a ratepayer known to be familiar with the weed was contacted and asked if the weed was present or absent.

Information received from the surveys was used to develop a final scentless chamomile distribution map for the province.

Biological control agents

Before 1999, biological control agents were released near industrial corridors. The establishment of these agents was monitored.

The scentless chamomile seed weevil (*Omphalapion hookeri*) was monitored by counting the

number of adult weevils that were present at a release site in June. The number of adults found on scentless chamomile flowers after a 30-minute search was recorded.

The scentless chamomile gall midge (*Rhopalomyia tripleurospermi*) was monitored by counting the number of galls that have formed on scentless chamomile. The search for galls ended when 10 galls were found. When 10 galls could not be found at the end of a 30-minute search then the number found was recorded.

During the last three years, biological control agents were released on scentless throughout the province.

Results

Scentless chamomile distribution

Saskatchewan Inventory maps were received from 222 rural municipalities. Survey results were not received from 75 rural municipalities. In Saskatchewan, scentless chamomile was present in 199 rural municipalities and was not found in 98 rural municipalities.

One hundred and ninety nine rural municipalities reported that the weed was found growing on 867 miles of the provincial highway system and 2814 miles of municipal roads. In the province, 3681 miles of roads and highways are known to have supported the growth of scentless chamomile. In Saskatchewan, there are 131,191 miles of roads, composed of 16,234 miles of highway and 114,957 miles of municipal roads.

In the 222 rural municipalities that have scentless chamomile growing along their roads, the weed was found growing around grain terminals or elevators in 27 rural municipalities, along waterways in 78 rural municipalities and along part of the railway system in 36 rural municipalities. Grain terminals or elevators are often visited by grain producers and these sites are areas of high risk for transport of the weed to new sites. Flowing water is an excellent vehicle for the movement of scentless chamomile throughout rural municipalities within the province. The weed has appeared in fields, which are adjacent to railway right-of-ways that are known to harbour the weed. Rural municipalities through their Weed Inspectors are encouraged to search for for the weed growing around high risk sites for weed transport.

Scentless chamomile was found growing in 13 rural municipalities but the weed was not found growing on their road right-of-ways. In these municipalities, the weed was growing around farmyards (4), in fields (4), along a railway (1), around grain terminals - elevators (2) and within urban centres (3). There was one reported occurrence for each rural municipality except for the Rural Municipality of Fertile Valley #285. In that municipality, scentless chamomile was found growing around grain elevators and in a field. It is assumed that these sites are examples of how scentless chamomile first arrived in a rural municipality.

Biological control agents

The scentless chamomile seed weevil and gall midge have successfully established in the province. Up to 2000, seed weevils were released on at least 97 sites and gall midges were released on 12 sites.

Between 1995 and 1997, 500 adult seed weevils were released at a release site in the fall. One year after release, one or more adult weevils were found at 8 of 20 release sites. The average number of adults found at a release site was one. Three years after release, one or more adult weevils were found at 14 of 20 release sites. Four years after release, one or more adult weevils were found at 24 of 30 release sites. A scentless chamomile plants produces a large number of flowers, which must be searched for weevils. Because weevils are difficult to find, one per site is a good indication of establishment. If a weevil cannot be found, the site or any scentless chamomile plants that are growing near the site should be searched for weevils at least one more time during another season.

Between 1999 and 2001, 60 adult weevils were released in the spring, prior to the formation of flowering. One year after release, adults could not be found at three release locations. Therefore, it is recommended that monitoring should start 3 years after release when releases are 60 adult weevils per locations.

From 1993 to 2001, Dr Alec McClay at the Alberta Research Centre monitored the spread of scentless chamomile weevils from the release point. Between 1993 and 1997, the weevils moved less than a kilometer from the release point. In 2001, adults were found 14 km from the release point. In Saskatchewan, seed weevils are often release in vegetation dominated by scentless chamomile with grasses and forbs growing as minor species. Five years later, grasses and forbs can dominate the release site. When this occurs the seed weevils move to any scentless chamomile that is growing nearby. Therefore, sampling 3 years after release is the optimum time to monitor for establishment. Furthermore, release sites should be selected to ensure the dominance of scentless chamomile for as long as possible.

The scentless chamomile gall midge was first released in Saskatchewan in 1999. Because the gall midge can produce 2 and perhaps 3 generations per year, the biological control agent is expected to increase rapidly. Galls can be easily found in the fall of the release year. In 2000, galls were observed at all but one of the release sites in Saskatchewan. In 2001, galls were found on the site, which did not appear to have galls in 2000.

During 2001, record low precipitation was recorded in many areas of Saskatchewan. Gall midges established in at three sites, which are located in the western and driest part of the province.

Conclusions

Many locations throughout Saskatchewan do not have scentless chamomile. Controlling the spread of scentless chamomile will help to prevent the weed from becoming a serious weed in all of the agriculture areas of the province.

Seed weevils are establishing in the province and their populations are increasing.

Gall midges are establishing in the province and their populations are increasing. Gall midges have established in the driest areas of the province.