

Management and control options for common ragweed

Physical:

Mowing, hand-pulling, tilling and burning are all physical options that can be employed to reduce the population. Mowing at a height of 2 cm when the plant is in flower or in seed set can reduce the seed bank or pollen count (Vincent *et al.* 1992). New experience in Switzerland shows that mowing before the flowering period reduces pollen production and seed production. The side-sprouts which are developed after mowing can be treated with a herbicide to kill the plant (C. Bohren., pers.comm., 2007).

Mechanical:

Mechanical control options are the most expensive approach to control (Vincent *et al.* 1992), but mechanical options work best in areas with scattered patches or in highly sensitive areas like along roadsides (Bohren, 2006). If mowing for control, then follow-ups may be needed in the season to prevent re-sprouting or re-flowering of shoots (NRW, 2007).

A single application of mowing or prescribed burn is recommended in older areas with perennial vegetation that does not have a frequent disturbance regime so that the perennial vegetation can out-compete the ragweed (Lewis, 1973). Mechanical, fire and chemical applications all retard the plant community succession (Lewis, 1973). If an area is under consistent disturbance then continuous mowing or spraying is recommended (Lewis, 1973).

Chemical:

Herbicides can be difficult to apply to this plant depending on the land use situation. Common ragweed is closely related to the sunflower and other members of the Compositae family, making most herbicides, not recommended for control, when in agricultural fields containing related species. When crop species belong to this family, crop rotation followed by a chemical application should be considered until ragweed is under control (CABI-Bioscience, 2005). Herbicides are also not recommended for use in high risk environments like watershed areas and roadsides (Bohren, 2006).

Dicamba and Clopyralid and some triazines are some herbicides used to control common ragweed. Sulfonylureas - a family of herbicides used in almost all types of crops - are not sufficiently effective. Careful reading of the labels for application rates and local, state, and federal laws apply when using any chemical. If perennial grasses are present it is best to spot spray a chemical application in order to retain the vegetative cover (Lewis, 1973).

Cultural:

Re-vegetation of native perennials and winter annuals can out-compete and suppress annual ragweed growth (Raynal & Bazzaz, 1975). Re-vegetation after disturbance can reduce competitive advantage of ragweed for resources (Wan & Wang, undated).

Integrated management:

Because of the ability of ragweed to develop side sprouts after mowing or incomplete hand pulling or less effective herbicide treatment, it is recommended to combine management techniques.

Biological:

Several species have been used for biological control of common ragweed with varying success. *Ophraella communa*, a chrysomelid beetle has shown a host preference of common ragweed over related species like sunflower. This beetle species is considered ideal for bio-control by Dernovici *et al.* (2006), because it is easy to mass rear and handle, has a high feed potential and high reproductive potential. *Zygogramma suturalis* is another chrysomelid beetle that has been released in Russia, China, and Croatia, but was only successful when ragweed populations were abundant and dense, with the beetle's population reduced after crop rotation (Reznik, 2000). *Z. suturalis* experienced heavy predation from mantids, spiders, and other predators on eggs and larvae, reducing its effectiveness (Wang &

Wan, undated). A noctuid moth, *Tarachidia candefacta* and a stem galling tortricid moth, *Epiblema strenuana*, have both been released as bio-control agents (Dernovici *et al.* 2006; Wan & Wang, undated) in the USSR and China. *E. strenuana* has shown host-specificity to common ragweed and has been observed to experience less predation than *Z. suturalis* (Wan & Wang, undated).