

Anthemis cotula
Mayweed chamomile
Asteraceae

Anthemis cotula is a herbaceous annual member of the composite family native to the Mediterranean. Each capitulum produces many achenes which are circular in cross section and contain a single smooth seed. The outer surface of the pericarp wall, which encloses the seed, has ten roughened longitudinal ribs. Achenes are 1.3 to 1.8 mm long and 0.7 to 1.9 mm wide (Gealy et al. 1985). Germination and emergence are normally very low in the fall of the year in which the achenes are produced, much higher the following year, and slightly higher in the third year (Roberts and Neilsen 1981). Plants are commonly found along roadsides and in poorly managed pastures in the U.S. (Smith 1987), and this species is becoming increasingly problematic as weeds in cropping systems in the Pacific Northwest (Gealy et al. 1994). In this region, mayweed infestations have been previously restricted to low, wet areas, but recently this species has become increasingly established in other areas as well. This may be due to conservation tillage practices in which soil moisture remains high for extended periods of time and weed seeds remain at or near the soil surface (Gealy et al. 1985).

A. cotula may have detrimental effects on neighboring plants both via competition and allelopathic effects. Competition experiments showed that *A. cotula* is a weak competitor against peas (*Pisum sativum*), but because it continues to grow after peas senesce it interferes with crop harvest, and dense stands reduce pea growth (Ogg et al. 1993). Greenhouse experiments showed that the interference between *A. cotula* and peas occurs mainly underground, and that soil moisture is more important than nitrogen in controlling the outcome of this interaction. Decreasing soil moisture increased the aggressiveness of *A. cotula* relative to pea. Nitrogen added at 20 mg/wk had no effect on peas, but more than doubled the size of *A. cotula*, though the aggressiveness of the latter was not increased (Ogg et al. 1994). The results of this study indicate that *A. cotula* might be most troublesome in fine-textured, poorly drained soils that are high in nitrogen.

A. cotula has also been found to have allelopathic effects (Smith 1987, 1990). Results of laboratory bioassays and growth chamber experiments indicated that water extracts of *A. cotula* are potentially allelopathic to alfalfa (*Medicago sativa*) and Italian ryegrass (*Lolium multiflorum*) seedlings. Leaf tissue mixed in potting soil significantly reduced the growth of these species. The extract and tissue concentrations used in this research were estimated to be similar to concentrations expected to occur within pastures (Smith 1987). Leaf tissue extracts had a stronger effect than did those from stems and roots, and the effect was more pronounced for seedling growth than for germination (Smith 1990).

In a study of factors influencing germination of *A. cotula* seeds, Gealy et al. (1985) found that maximum percent germination for seeds and achenes occurred at 20°C, and that achene germination was lower for seed germination under all conditions tested. Both acid scarification for 15 minutes and soaking in a 14 mM gibberellic acid solution more than doubled achene germination. Pericarp leachate inhibited achene and seed germination at high concentrations, indicating that pericarp leachate is not the primary cause of reduced achene germination. Optimum germination occurred at a pH of 4.5 and over a range from pH 3 to pH 6. Achene germination was inhibited by moisture stress to a greater degree than was seed germination. A soil moisture potential of -10,000 kPa reduced germination and total plant weight by as much as 95% and 80%, respectively (Gealy et al. 1994).

Control of *A. cotula* using herbicides was investigated by Smith (1987). Glyphosphate at 1.2 kg/ha and paraquat at 0.3 and 0.6 kg/ha applied during mid-March after germination of *A. cotula* and before initiation of growth by forage species provided good weed control with minimal crop damage.

Glyphosate at 0.6 kg/ha and dinoseb, 2,4-D and 2,4-DB applied at rates considered safe to the crop did not provide acceptable control of *A. cotula*.

References:

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(Compiled by Karen Haubensak, UC Berkeley, March 1999, for Channel Islands National Park)