

The biology and non-chemical control of Pineappleweed (*Matricaria discoidea* DC.)

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Pineappleweed

(rayless chamomile, rayless mayweed)

***Matricaria discoidea* DC.**

(*M. suaveolens*, *M. matricarioides*, *Chamomilla suaveolens*)

Occurrence

An introduced winter or summer annual weed of barish places by paths and in waste places (Stace, 1997). Pineappleweed, a native of NE Asia, was first recorded in Britain in 1871 (Grime *et al.*, 1988). Initially it was only recorded in 4 scattered sites in the UK. Within 25 years it had spread along roadsides throughout most of England (Salisbury, 1961). It remains an increasing weed especially on byways (Clapham *et al.*, 1987). It is also a common garden weed (Copson & Roberts, 1991). Pineappleweed likes an open loamy or sandy loam soil (Hanf, 1970). It appears to have some salt tolerance (Grime *et al.*, 1988).

Pineappleweed is a common weed of cereals and broad-leaved arable crops (Grime *et al.*, 1988). It increased in horticultural crops in the 1970s when it was tolerant to some of the more widely used herbicides (Davison & Roberts, 1976). In a study of seedbanks in some arable soils in the English midlands sampled in 1972-3, pineappleweed was recorded in 38% of the fields sampled in Oxfordshire and 50% of those in Warwickshire but only in low numbers (Roberts & Chancellor, 1986). Pineappleweed seed was found in 2% of arable soils in a seedbank survey in Scotland in 1972-1978 (Warwick, 1984). It was also a common weed in a seedbank survey in swede turnip fields in Scotland in 1982 (Lawson *et al.*, 1982). It was found in 45% of fields sampled, often in moderate numbers. It has increased as a weed of intensive vegetable crops (Roberts, 1983). In a survey of seeds in pasture soils in the Netherlands in 1966, while pineappleweed was uncommon in the sward it was well represented in the soil seedbank (Van Altena & Minderhoud, 1972).

Populations of pineappleweed have been found with resistance to triazine herbicides following long-term use of the chemicals for weed control in hops and fruit (Clay, 1989).

Pineappleweed is used medicinally and is an effective worming treatment that is neither irritant nor toxic in children (Barker, 2001). The flowers are aromatic when crushed (Grime *et al.*, 1988).

Biology

Pineappleweed flowers from June to September (Morse & Palmer, 1925) sometimes into November (Hanf, 1970). Insects seldom visit the flowers (Grime *et al.*, 1988). Seed is set from July onwards within 40-50 days of flowering. The average seed number per plant is given as 850 by Stevens (1932), 7,000 by Salisbury (1961) while other authors quote 6,400 seeds per plant (Stevens, 1957). The average seed number

per plant in ruderal situations is given as 5,655 (Pawlowski *et al.*, 1967). The 1,000 seed weight is 0.13 g (Stevens, 1932).

In Petri dish tests with seed maintained under high or low light intensity or in darkness, seed germinated to around 60% in the light but there was only 2% germination in the dark (Grime & Jarvis, 1976). Seed stratified outdoors in soil overwinter was exhumed and tested for germination in the light, in the dark and in the dark with a 5 second flash of light (Andersson *et al.*, 1997). Seed gave complete germination in the light, 86-93% germination in the dark with a short flash of light and 2-34% germination in darkness. Germination is increased by a period of dry storage (Grime *et al.*, 1988).

Seed mixed into a 15 cm layer of soil in cylinders sunk in the field and stirred periodically, emerged from February to November with peaks in March and at intervals through the rest of the emergence period (Roberts & Feast, 1970). In a similar study with seeds mixed in a 75 mm layer of soil, odd seedlings emerged throughout the year with peaks in April-May and August-October (Roberts & Nielson, 1981). Around 8% of seeds remained after 5 years. Seed mixed into the surface 25 mm of soil in boxes out of doors and stirred periodically emerged from March to December (Chancellor, 1979). The main period of emergence was from April to August with a peak in May-June.

In a sandy loam soil, field seedlings emerged from top 0-10 mm of soil with 78% from the surface 5 mm (Unpublished information).

The shortest time to flowering (40-50 days) occurred when emergence took place from mid-May to mid-July and plants then fruited and died before winter (Roberts & Feast, 1974). Plants emerging from January to April remained vegetative for longer. Plants that emerged after August were likely to overwinter as rosettes that flowered in late-spring. Daylength was the controlling factor, and flowering was delayed at shorter daylengths.

Persistence and Spread

Thompson *et al.* (1993) suggest that based on seed characters, pineapple weed seed should persist for longer than 5 years in soil. Seeds mixed with soil and left undisturbed had declined by 83% after 6 years but in cultivated soil the decline was 91% (Roberts & Feast, 1973). Seed buried in soil in sub-arctic conditions had 60, 20 and 1% viability after 2.7, 6.7 and 9.7 years respectively (Conn & Deck, 1995).

Seeds are dispersed in mud on vehicle tyres, on footwear and by rain splash. Seeds are also found in horse droppings (Salisbury, 1961).

Management

Seed production should be prevented by hoeing and hand-pulling (Morse & Palmer, 1925). Pineappleweed seedlings were more numerous on tined cultivated or no-till land than on ploughed land (Pollard & Cussans, 1976).

In grassland, pineappleweed may colonise areas in gateways and around food and water troughs where livestock have trampled and caused poaching (Wells, 1985).

Seedlings with 2-6 leaves are tolerant of flame weeding (Ascard, 1998).

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