The biology and non-chemical control of Prickly Lettuce (*Lactuca serriola* L.)

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Prickly Lettuce

(compass plant, lobed prickly lettuce, wild lettuce)
***Lactuca serriola* L.**
(*L. scariola* L.)

Occurrence

Prickly lettuce is an annual, rarely biennial weed probably native in waste places, rough ground, disturbed areas and on walls (Clapham *et al.*, 1987; Stace, 1997). It also occurs in cultivated fields and along roadsides (Frankton & Mulligan, 1970). It is frequent in England especially in East Anglia and the south east.

In the USA, prickly lettuce populations have been found with resistance to sulfonylurea herbicides following five years use of the chemicals for weed control in consecutive wheat crops (Reed *et al.*, 1989). The resistance trait is controlled by a single gene with incomplete dominance (Mallory-Smith *et al.*, 1990).

Biology

Prickly lettuce flowers from July to September and is automatically self-pollinated (Clapham *et al.*, 1987). Each flower head produces 12-17 seeds and a plant may have 2,350 to 8,260 seeds according to Alcocer-Ruthling *et al.* (1992). Others give the average number of seeds per plant as 27,900 and the 1,000 seed weight as 0.45 g (Stevens, 1932). The average seed number per plant in ruderal situations is given as 17,948 (Pawlowski *et al.*, 1967).

In laboratory tests, seeds appear relatively indifferent to light but when seeds were put to germinate under a leaf canopy or in diffuse white light there was 10% germination under the canopy and 100% in the light (Górski *et al.*, 1977).

Seedlings begin to emerge in April with a second smaller peak in September (Chepil, 1946). Few of the seeds sown in a 75 mm layer of soil in open cylinders in the field and stirred periodically emerged soon after sowing in autumn (Roberts, 1986). In the following year the seedlings emerged from February to September but the main emergence peak was in April with a smaller one in September. Emergence tended to follow soil cultivation. A reducing number of seedlings emerged each year but none after year 4 of the 5-year study.

The plants form a strong taproot (Frankton & Mulligan, 1970)

Persistence and Spread

In Duvel's burial experiment, seed buried at 8, 22 and 42 inches gave 64, 69 and 70% germination respectively after year 1, 75, 59 and 67% after year 3 but none at year 6 onwards (Toole, 1946; Goss, 1924). In another study, buried seeds gradually lost viability over a 3-year period but seeds on the soil surface did not persist that long (Alcocer-Ruthling *et al.*, 1992). In a cultivated soil seeds did not persist longer than 4

years (Roberts, 1986). Seed submerged in water gave only 1% germination after 3 months (Comes *et al.*, 1978). Seed in dry storage gave 54% germination after 2 years.

The seeds have a pappus of hairs that aids wind dispersal (Thill & Mallory-Smith, 1997). Prickly lettuce seeds have been dispersed at least 100 m by the wind. Seed has been recovered from irrigation water (Kelley & Bruns, 1975; Wilson, 1980).

Management

Phytoparasitic bacteria have been considered as potential biological weed control candidates for prickly lettuce. Spray applications of *Pseudomonas syringae* with surfactant added have caused severe disease symptoms and plant death (Johnson *et al.*, 1996).

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