

The biology and non-chemical control of Small Nettle (*Urtica urens* L.)

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Small nettle

(annual nettle, burning nettle)

Urtica urens L

Occurrence

Small nettle is a common, summer annual weed of arable land that causes considerable trouble to growers of early potatoes (Long, 1938). It is found on cultivated ground and waste places, particularly on light soils. The unpleasant sting it can inflict makes annual nettle a nuisance where hand labour is used. It occurs locally throughout the UK but is commoner in the east (Clapham *et al.*, 1987; Stace, 1997). It is favoured by soils with a high content of organic matter especially in gardens and horticultural soils and is recorded up to 1,650 ft in Britain (Salisbury, 1961). The presence of this weed is an indication of the need for lime (Long, 1938). Small nettle is intolerant of heavy shading (Greig-Smith, 1948).

In a survey of UK arable weeds in 1971-73, small nettle was absent or rare in many of the tetrads surveyed but common to abundant in 13% and tended to be a horticultural weed (Chancellor, 1977). It was one of the main weed species present in conventional sugar beet crops surveyed in East Anglia in autumn 1998 (Lainsbury *et al.*, 1999). It was common in the field margins too. Small nettle seed was found in 4% of arable soils in a seedbank survey in Scotland in 1972-1978 (Warwick, 1984). In a comparison of the ranking of arable weed species in unsprayed crop edges in the Netherlands in 1956 and in 1993, small nettle remained in 24-25th place (Joenje & Kleijn, 1994).

Small nettle is an important constituent in the diet of many farmland birds including bullfinches and dunnocks (Lainsbury *et al.*, 1999). It has similar medicinal and therapeutic uses to the common nettle, *U. dioica* (Barker, 2001).

Biology

Small nettle flowers from June to September or until killed by frost (Clapham *et al.*, 1987; Grime *et al.*, 1988). The flowering period is also given as May to November (Hanf, 1970) and April to October (Greig-Smith, 1948). The flowers are wind pollinated. Seed is set from June onwards. Plants flower and set seed rapidly but continue to grow and produce further inflorescences until killed by frost (Greig-Smith, 1948). Drought conditions tend to promote earlier flowering (Boot *et al.*, 1986). There may be 100 to 1,300 seeds per plant according to Guyot *et al.* (1962). The average seed number per plant is 6,080 according to Pawlowski *et al.* (1970). Others give the average seed number per plant as 1,000 but a large plant may have 40,000 seeds (Salisbury, 1962). Small nettle can be found in fruit for 4 months of the year. The time from germination to fruiting is around 100 days (Guyot *et al.*, 1962).

Seeds produced early in the year may germinate at once, those shed later in the year germinate the following spring (Greig-Smith, 1948). Seeds sown on May 12th had germinated by June 2nd (Long, 1938). Seed sown in a 75 mm layer of soil in cylinders

sunk in the field and stirred periodically emerged from March to October with peaks in April and July (Roberts, 1964). Seedling emergence in Scotland recorded in field plots dug at monthly intervals began in April and continued through until October with a peak in May/June (Lawson *et al.*, 1974). Seed that had been dry-stored was buried outside in pots in the autumn and then exhumed at monthly intervals from March to October and the germination tested in the laboratory (Milberg & Andersson, 1997; Andersson & Milberg 1996; Andersson *et al.*, 1997). Exhumed seed germinated well at any time of the year if given just a 5 second flash of light but there was poor germination in complete darkness. In full light there was some germination from March to May but the best germination was from June to October. Seeds germinate well in partial shade but bright light may inhibit germination. In Petri dish tests with seed maintained under high or low light intensity or in darkness, seed gave 89% germination in low light but only 3% in bright light (Grime & Jarvis, 1976). There was 29% germination in the dark. A 3-month period of moist storage at 5°C did not promote seed germination (Grime *et al.*, 1981).

In the field, 87 to 100% of seedlings emerged from the surface 30 mm of sand and peat soils with the odd seedling emerging from as far down as 60 mm (Chancellor, 1964). In a sandy loam soil, field seedlings emerged from the top 45 mm of soil with the majority from the upper 20 mm (Unpublished information).

Persistence and Spread

Seeds mixed with soil and left undisturbed had declined by 61% after 6 years but in cultivated soil the decline was 96% (Roberts & Feast, 1973). Seed recovered from excavations and dated at 20, 50 and 100 years old is reported to have germinated (Ødum, 1974).

Small nettle seeds have a persistent perianth that catches on clothing and animal fur to aid dispersal. Seeds have been found in cattle droppings (Salisbury, 1961). The seeds do not float in water. In a survey of seed contamination in 1960-61, small nettle seed was found in 1% of brussels sprout and 1% of lettuce seed samples tested (Gooch, 1963).

Management

Regular and frequent hoeing is required to prevent seeding (Long, 1938; MAFF, 1948; Morse & Palmer, 1925). Small nettle is absent from habitats that are cut or grazed (Grime *et al.*, 1988). It is not eaten by rabbits (Tansley, 1949).

In a market garden rotation, small nettle numbers increased by around five-fold following the addition of organic manures to the soil whether these were based on farmyard manure or sewage sludge (Mann, 1957). There was no further rise in numbers by increasing the rate of manure from 15 to 30 tons per acre.

Seedlings with 2-6 leaves are controlled by flame weeding (Ascard, 1998). Small nettle seed is susceptible to soil solarization. In studies to assess the use of UV radiation for selective weed control, small nettle was relatively sensitive at both the 2-leaf and 12-leaf stage (Andreasen *et al.*, 1999).

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