

The biology and non-chemical control of Common Bent (*Agrostis capillaris* L.)

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Agrostis capillaris L

(*Agrostis tenuis* Sibth, *A. vulgaris* With.)

Common bent

(common bent-grass, brown bent, colonial bent, fine bent, highland bent)

Occurrence

Common bent is a native rhizomatous, perennial grass with a creeping habit. It is frequent and widely distributed particularly on acid grassland, damp soils, meadows, pasture and rough ground (Clapham *et al.*, 1987; Stace, 1997). It is characteristic of upland pasture in short turf. It is recorded up to 3,980 ft in the UK (Salisbury, 1961). Common bent has a preference for poorly drained, fine to medium textured soils of pH 6.5 to 7.3 with a moderate level of organic matter (Dale *et al.*, 1965).

Common bent grows on nutrient poor meadows, heathland and in forest gaps (Weber, 2003). It is a calcifuge and invades areas of poor acid soils. It can establish quickly after soil disturbance, vegetation clearance and burning. Common bent is often dominant in poor semi-natural pasture on neutral soils (Tansley, 1949a; 1949b). It probably covers a greater area in the UK than any other grass. The shoots wither in late-summer and it is of limited grazing value in many pastures. However, it is an important staple in upland sheep pasture in regions of high rainfall. In set aside land in Scotland common bent was the most abundant grass in unsown fields and represented around 10% of the total ground cover (Fisher *et al.*, 1992).

Common bent is highly variable with many cultivars recognised. It is a widely used lawn grass. There is wide phenotypic and genotypic variation in populations (Grime *et al.*, 1988). Analysis of plants in natural populations using DNA testing revealed a higher level of genetic variability than would be expected from a species that reproduces vegetatively rather than sexually (Sinclair *et al.*, 1997). There was no correlation between variability and the distance that separated the test plants. Common bent forms hybrids with creeping bent (*A. stolonifera*).

Biology

Common bent flowers from June to August (Clapham *et al.*, 1987). The flowers are wind pollinated and seed is set from August to October (Grime *et al.*, 1988).

In Petri-dish tests with seeds maintained under high or low light intensity or in darkness, seeds gave around 80% germination in the light and 54% in the dark (Grime & Jarvis, 1976). Germination was moderately high at alternating temperatures in darkness or under a green 'safe' light but was much lower at a constant temperature in darkness (Grime *et al.*, 1981). In the field, seeds germinate in autumn and spring (Grime *et al.*, 1988).

Common bent propagates by both seed and rhizomes (Long, 1938). The rhizomes lie just below the soil surface and do not penetrate deeply. They are much thinner than the rhizomes of common couch.

Persistence and Spread

Thompson *et al.* (1993) suggest that based on seed characters, common bent seed is likely to persist for longer than 5 years. Unlike most grasses, the seeds have been recorded in enormous numbers in the soil beneath pastures even though the plant may be poorly represented in the vegetation (Champness & Morris, 1948). In an acidic grassland with ant-hills present, common bent seeds were far less numerous in the ant-hill soil than in the soil under the sward (King, 1976). Seed buried in mineral soil at 13, 26 or 39 cm depth and left undisturbed retained 28, 21 and 3% viability respectively after 4 years but none was viable after 20 years (Lewis, 1973). Seed buried in a peat soil at 26 cm for 1, 4 and 20 years retained 18, 3 and 0% viability respectively. Seeds buried at different depths with different water tables gave high levels of germination when recovered after 1 or 2 months burial (Lewis, 1961). Seed remained viable for over 7 years in dry storage but in soil all but 1.8% had germinated or perished within 7 years (Rampton & Ching, 1970). The loss was most rapid in the first 3 years. Seed stored under granary conditions exhibited 72% viability after 1 year, 2% after 4 years and 3% after 20 years. The few seeds that survived storage for 20 years produced apparently normal seedlings when germinated.

Common bent seed has been recovered from irrigation water in the USA (Kelley & Bruns, 1975). Seeds are known to be consumed by earthworms but seeds have not been recovered from wormcasts (McRill & Sagar, 1973; McRill, 1974).

Common bent spreads vegetatively by short rhizomes and stolons (Weber, 2003).

Management

Control is by ploughing, grubbing and harrowing to reduce common bent and prevent seeding (Long, 1938). Hedgerows should be kept free of the weed. Short rotations with extra root crops will help to combat it. The chief aim is the removal or destruction of the creeping stems (Morse & Palmer, 1925). Isolated patches may be forked out and burnt. Smother crops of maize, vetches or mustard will help in choking out the weed.

Under frequent cutting, common bent produces small tillers close to the ground (Grime *et al.*, 1988). Common bent exhibits some tolerance to burning. In permanent grassland, the percentage cover of common bent was reduced following fertilizer application (Williams, 1985). Seed numbers in the soil seedbank were also reduced. Under severe grazing, common bent will soon appear in grassland and within 5 years it can make up a significant proportion of the sward (Spedding, 1966). Control is by liming, good manuring and cutting before seeding (Morse & Palmer, 1925).

Common bent is grazed by rabbits and this inhibits flowering (Gillham, 1955). However, it is relatively tolerant of rabbit grazing (Tansley, 1949a; 1949b).

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