Weed 4. Capeweed

Arctotheca calendula

Common names

Capeweed, Cape dandelion.

Distinguishing characteristics

Capeweed is a prostrate, stemless, sprawling annual herb that germinates during autumn and winter. It has hairless, club-shaped cotyledons. The first two leaves grow as a pair, are spear-shaped and may be scalloped. Subsequent leaves grow singly and are deeply lobed with a rounded apex. Leaves are succulent, the upper surface is hairy, and the lower surface is covered with a mat of white hairs.

Solitary 'daisy-like' flower heads are brilliant yellow (ray florets) with blackish purple central disc florets. Seeds are covered in pink–brown fluffy, woolly hairs.

Figure 4.1 Mature capeweed plant Photo: Andrew Storrie

Other weeds that can be confused with capeweed

During vegetative stages capeweed may be confused with dandelion, brassica weeds, flatweeds, thistles, fleabanes, skeleton weed and white arctosis *(Arctosis stoechadifolia)*, a coastal sand-stabilising perennial weed.

Factors that make capeweed a major weed

Capeweed is a competitive plant

It competes with crops (cereals, pulses, canola) for water, nutrients and probably light, resulting in yield reduction. Plants emerging in early autumn become large before the crop is sown and compete strongly with the crop. A plant at rosette stage can be as big as 600 mm in diameter and can outcompete any other plants that are shorter than capeweed plants. Such large plants are difficult to control with herbicides. They are often transplanted during the planting operation, and their re-emergence with crop plants can lead to population levels that decrease crop yield. In Western Australia competition from 7–90 capeweed plants/m^2 in a wheat crop may reduce crop yield by 28–44% and net return by 2 5–76%.

A capeweed plant growing under favourable conditions can produce up to 4,330 seeds

Seeds may be dispersed by human activity, animals, wind and water.

Capeweed can develop resistance to herbicides

In Victoria it has developed resistance to diquat and paraquat (Group L).

Capeweed can cause animal health problems

It is often associated with scouring in sheep. Capeweed can also cause nitrate and nitrite poisoning of livestock, particularly ruminants. This occurs more frequently in starved animals given access to potentially toxic plants, in stressed animals (during mustering, droving or other handling), or with lack of acquaintance/adaptation. It can also occur under normal grazing in some seasons. Stock deaths may occur after spraying with hormones and other herbicides that elevate nitrate content in the capeweed. This usually occurs from early season spraying, when temperatures are higher and dull weather follows. Nasal granuloma may occur in cows that inhale air with high concentrations of capeweed pollen for long periods. Woolly seeds in unopened buds may cause hair balls and death in sheep. In humans, capeweed can cause contact dermatitis and hay fever.

Figure 4.2 Capeweed seedling Photo: Catherine Evans

Table 4.1 Tactics that should be considered when developing an integrated plan to manage capeweed *(Arctotheca calendula)*

Capeweed *(Arctotheca calendula)*		Most likely % control (range)	Comments on use
Agronomy 3 Herbicide tolerant crops		90 (80–95)	Good control can be achieved in triazine-, imidazolinone- and glyphosate-tolerant crops.
Tactic 1.3	Inversion ploughing	90 (50–98)	Use skimmers to ensure deep burial of seed. Not suitable for some soil types.
Tactic 1.5	Delayed sowing	60 (50–90)	Works best on undisturbed paddocks.
Tactic 2.1	Fallow and pre-sowing cultivation	60 (20–95)	Requires drying conditions following cultivation. Transplants are common in wet conditions. Burial of seed will lead to dormancy.
Tactic 2.2a	Knockdown (non-selective) herbicides for fallow and pre-sowing control	80 (70–99)	Good control of actively growing unstressed weeds. Poor control of early germinated weeds that have lost leaves due to early season drought.
Tactic 2.2b	Double knockdown or 'double knock'	90 (80–99)	Better control of hard to kill plants and those in dense infestations.
Tactic 2.2c	Pre-emergent herbicides	75 (70–85)	Diuron and picloram provide good control.
Tactic 2.2d	Selective post-emergent herbicides	90 (80–99)	Clopyralid provides good control, especially of hard to kill plants. Limited control options in leguminous crops. Spray-grazing is good for pastures.
Tactic 3.2	Pasture spray-topping	70 (30–90)	Graze heavily in winter to ensure uniform flower emergence. Graze or respray survivors.
Tactic 3.4	Renovation crops and pastures – green manuring, brown manuring, mulching and hay freezing	90 (80–99)	Graze heavily in winter to ensure uniform flower emergence. Graze or respray survivors.
Tactic 3.5	Grazing – actively managing weeds in pastures	50 (30–80)	Rotationally graze pastures and use spray-grazing with MCPA or 2,4-D if necessary in clover based pastures. Flumetsulam plus diuron provides reasonable control in many other legume based pastures.

Environments where capeweed dominates

Capeweed is a serious weed of cultivation across southern Australia.

In pasture the status of this species as a weed is less clear-cut. For example, in drier parts of the Western Australian wheatbelt, capeweed is a useful forage plant, but in wet areas it is viewed as a weed because it occupies the area of more valuable and beneficial pasture species. In pastures, it may have both positive and negative effects on pasture and stock production.

Seasonal conditions that favour capeweed

This species is favoured by 'false breaks'. Low rainfall events can favour capeweed germination before other species because the woolly seed cover attracts moisture and reduces desiccation. It can also survive periods of drought better than most crops and pastures, so a dry period following good germinating rains increases the proportion of capeweed.

Conditions that favour germination and establishment

Autumn rains induce germination of capeweed if the soil surface remains wet for a few days. Subsequent rain and residual soil moisture continue to support growth of seedlings and these will persist through winter crops if not killed prior to crop sowing. The woolly hair around the seed assists early germination.

Seeds are usually dormant at maturity, with an after- ripening period of 2–3 months. Dormancy is rapidly overcome by summer temperatures around 40°C.

Secondary dormancy, a combination of embryo and seedcoat based dormancy, may be initiated by low winter temperatures. Long-term dormancy is dependent on regional adaptation. In Western Australia greater than 95% of capeweed seed from the southern agricultural area germinated on the soil surface at the break of the season. Only 5% of seed from the northern agricultural area germinated in the first year and 75% in the second season, with 20% remaining dormant for more than 2 years. Dormancy cycled to favour autumn germination.

Capeweed seeds kept in the dark or buried will remain dormant for longer than those exposed to light. Again, this appears to be ecotype dependent as seeds in Portugal showed almost complete germination at 1 5°C in continuous darkness, whereas in Australia seed burial prevented germination.

Optimal diurnal temperatures for germination were between 10°C and 1 5°C in research conducted in South Africa, but higher (25°C) in Western Australia. Germination is very low at temperatures above 30°C.

All these results were recorded in strong autumn flushes of germination in Mediterranean environments.

Seed survival in the soil

The survival of capeweed seed in the soil is likely to be very strongly influenced by the ecotype or location and by the degree of burial that occurs. In Western Australia, survival ranges from almost no carryover of seed from one season to the next, to in excess of 20% of seed-set being carried over for at least 2 years.

Contributors

Abul Hashem and John Moore

Further reading

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