

INTEGRATED WEED MANAGEMENT FACT SHEET

OXALIS

Soil Wealth
NURTURING CROPS



Integrated
Crop Protection
PROTECTING CROPS

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OXALIS

(*Oxalis* spp.)

Worldwide there are 570 species of oxalis, and approximately 30 species in Australia at the time of writing.

More commonly found in the southern parts of Australia, oxalis is an invasive weed of cultivated fields but is also found in no-till situations (e.g. roadsides and native landscapes).

Most oxalis species have their leaves divided into three leaflets of almost equal size, not to be confused with some clover species (Figure 1). The [Royal Botanic Gardens](#) in Sydney offer a website with a helpful oxalis identification key.

KEY POINTS AND RECOMMENDATIONS

- There are about 30 oxalis species in Australia, including **soursob** and **creeping oxalis**, which are discussed here
- **Preventing the spread of underground bulbs and seeds** is critical for control of soursob and creeping oxalis respectively
- Control measures in an integrated strategy should be undertaken **prior to flowering stage** for both species.



Figure 1. Morphological comparison of the leaves of oxalis (top) and clover (bottom). Most oxalis species have three heart-shaped leaflets (i.e. forming one trifoliate leaf) with smooth edges. This could be mistaken for some clover species but, in the case of clover, the leaflets tend to be ellipse-shaped with slightly serrated edges.

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INTEGRATED WEED MANAGEMENT (IWM) STRATEGY FOR COMMON OXALIS SPECIES IN AUSTRALIA

We discuss IWM for two most common perennial oxalis species in Australia, **soursob** and **creeping oxalis**, based on **targeting bulbs and seeds** respectively.

BULB VERSUS SEED OXALIS

One of the more common oxalis species found in Australia is **soursob** (*Oxalis pes-caprae*), also known as sourgrass or Bermuda buttercup. **Soursob plants grow from bulbs**, and stems emerge from the rhizomes growing near the surface of the soil (Figures 2,3). Soursob competes with most crops by sending

out translucent lateral rhizomes (Figure 3) which can spread into the middle of any crop or vegetation where plants compete heavily for space and light. Soursob flowers mostly in late winter through spring (August - October) throughout the southern half of Australia. However, no viable seed has been documented worldwide, including in Australia.

As this species reproduces vegetatively via underground cone-shaped bulbs (Figure 2), it is critical to target these bulbs. It is important to **take control measures before the plant flowers** as this is when the plant is most likely to produce bulbs along the rhizomes. Bulbs can be spread by cultivation and other machinery and vehicle movement as well as soil erosion, dust storms, water movement, birds and other animals.



Figure 2. Soursob whole plant in the field (soil transect, left) and its tuberous root with fibrous roots, rhizomes and cone-shaped bulbs (right)

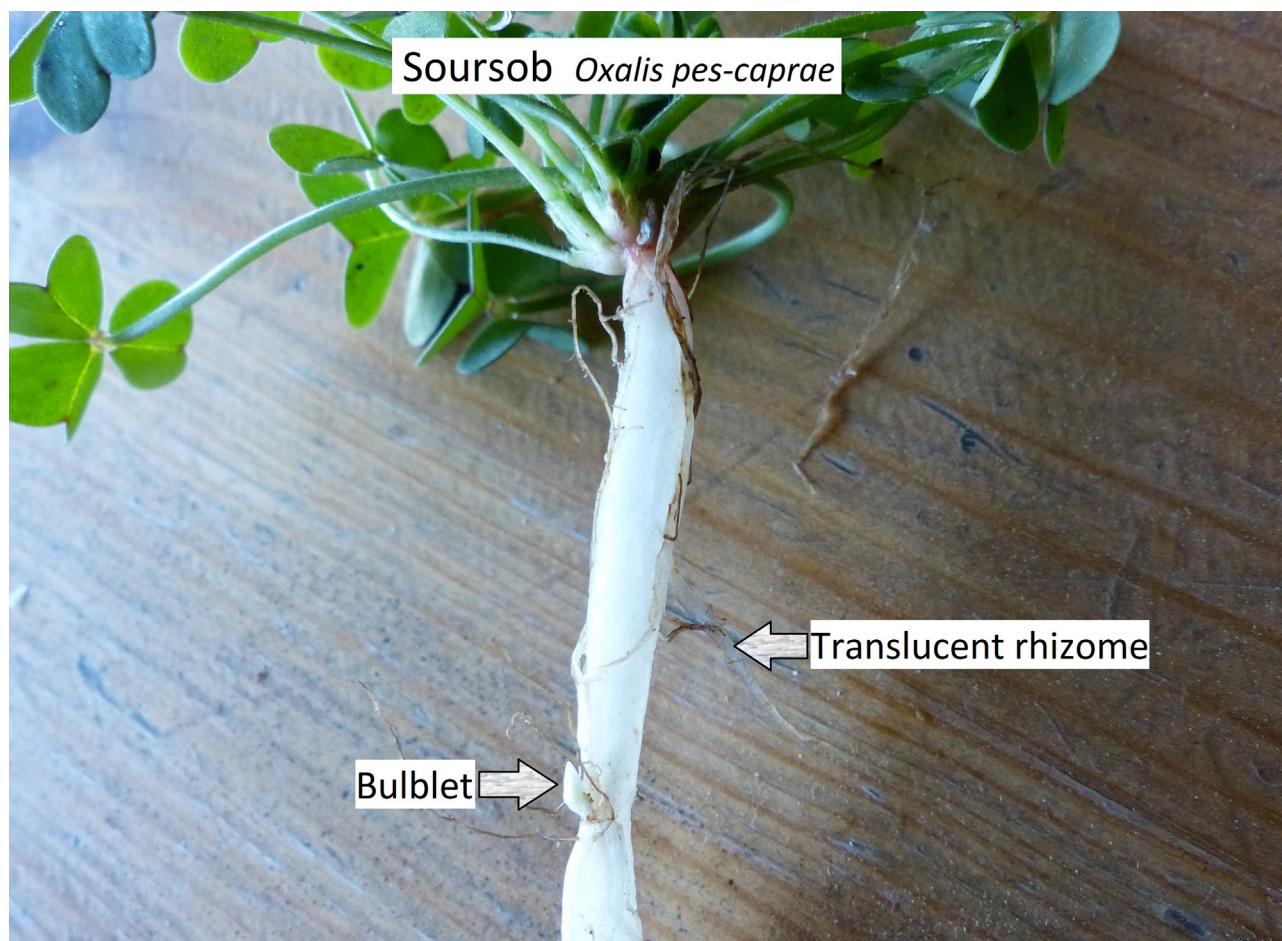


Figure 3. Soursob plant with bulblet (small bulb or bulbil) and translucent rhizome

Creeping oxalis or **creeping woodsorrel** (*Oxalis corniculata*) - as its name suggests - quickly runs along the surface of the soil and forms roots and stems where nodes contact the soil surface (Figure 4). It is a very invasive weed across most of Australia, especially in turf farms and lawns.

Unlike soursob, creeping oxalis does not produce underground bulbs. **Most importantly, each plant**

can potentially produce over 5,000 seeds. As the seed pods mature, they dry out, rupture and expel seeds up to three metres from the mother plant. **Therefore, controlling creeping oxalis before it flowers and sets seed is critical.** Seed set can occur in as little as four weeks from the seedling stage under ideal conditions.



Figure 4. Creeping oxalis “creeps” by forming nodes underneath branches and developing roots on each node. This plant has just started flowering (small yellow flowers).

CULTURAL MEASURES

Farm hygiene: Transplants should be free of creeping oxalis and soursob plants. Obvious weeds should be removed and destroyed, including roots. Creeping oxalis seed in transplant containers is more sinister and may lead to a need for hand weeding of germinated plants (at seedling stage). Machinery operating in paddocks should be cleaned at designated wash-down bays to limit the spread of viable seed and plant parts.

Seeds require light for germination. **Large biomass cover crops followed by strip-tillage** will reduce

germination of creeping oxalis in inter-row strips where sunlight cannot reach the soil. A combination of cover crops and strip tillage is also a good option for reducing soil erosion, soil disturbance and water movement, minimising the spread of soursob bulbs.

Tillage that brings soursob bulbs to the surface **during hot and dry conditions** might allow the bulbs to desiccate and no longer be capable of germination. However, multiple tillage passes will be required to bring new bulbs to the soil surface each time, which is impractical for most Australian vegetable farm operations.

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PHYSICAL CONTROL

Plastic mulches are very effective in controlling all species of oxalis, though they only tend to be used for certain high-value vegetable crops such as cucurbits.

Soil solarisation using plastic mulch can be effective in reducing weed seedbanks; a minimum of four weeks under clear plastic (with moisture) during the hottest summer months will provide the most effective results. Growers who include a summer fallow in their crop rotation may be able to take advantage of soil solarisation.

Hand weeding or “chipping” *Oxalis* spp. is impractical on a larger scale. Moreover, it is not effective for the control of soursob, as the bulbs not removed by hand weeding will remain viable under the soil surface and will readily be able to produce new plants. **Grazing** also is not a good practical option. When consumed in large quantities, oxalis can be toxic to livestock due to variable quantities of soluble oxalates present.

CHEMICAL CONTROL

Group B, Group C, Group D, Group G and Group I herbicides tend to have efficacy on *Oxalis* spp. weeds. At the time of writing (February 2021), **oxyfluorfen** (Group G) was registered for soursob in broccoli, cabbages and cauliflower. **Trifluralin** (Group D) was registered for use in brassicas, carrots and green and navy beans. **Bromoxynil** (Group C) was permitted in garlic and onion crops. In fallow, higher rates of **glyphosate** ahead of tillage can be effective. In turf, **fluroxypyr** is effective on *Oxalis* spp.

It is important for vegetable growers to follow plant back guidelines closely, especially for fluroxypyr since its half-life in soil is 5 – 9 days.

Only use pesticides in accordance with current APVMA registrations or those which are covered by a current APVMA permit. Always read the label and follow the instructions precisely. For current information on pesticide registrations and permits in Australia, consult the APVMA PubCRIS website <https://portal.apvma.gov.au/pubcris>

We acknowledge and thank UNE's review of this fact sheet through the project VG15070 'A strategic approach to weed management for the Australian Vegetable Industry'.

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