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UC IPM

Integrated Pest Management for Home Gardeners and Landscape Professionals

UC PEER REVIEWED

Dandelion

Dandelion, *Taraxacum officinale* (Figure 1), also known as lion's tooth, puffball, blowball, and monk's head, is a major problem in home lawns, commercial turf, ornamental plantings, pastures, and tree and vine crops. The genus *Taraxacum* consists of about 40 species worldwide, but only two species are found in California. *Taraxacum officinale* is found as a weed throughout California and *T. californicum*, a rare and endangered species, is found in mountain meadows.

Figure 1. Mature dandelion plant, *Taraxacum officinale*.

Dandelion was introduced from Europe where it has been used as an herb and medicinal plant since the time of the Roman Empire. The leaves and flowers are often used to make salads, beer, and wine. Mature leaves can be dried and used to make a mild tea. Roots can be used to make stronger tea, or dried and used for various medicinal purposes, including as a mild diuretic.

While dandelion does have its benefits, in this publication dandelion will be discussed as an undesirable weed in residential landscapes with options on how to manage it.

IDENTIFICATION AND LIFE CYCLE

Dandelion is a perennial plant that grows best in moist areas in full sun. Once established however, it can survive some shade and dry conditions. Dandelion grows year-round in California except in the coldest intermountain areas, where it is dormant during the winter.

It produces a strong taproot (Figure 2) most commonly found in the top 6 to 18 inches of the soil. Buds grow from the uppermost area of the root, producing a crown that can regenerate "new" plants even when the plant is cut off at or below the soil surface. Sections of the root as short as 1 inch are also capable of generating new plants.

There are no true stems; the leaves are instead clustered in a rosette at the base of the plant. Leaves vary in length from 2 to 14 inches and from ½ to 3 inches wide. Margins of the leaves are deeply serrated, forming the typical "lion's tooth" outline, from which the common name is derived (Figure 3). In French, *dent-de-lion* means "tooth of the lion."

Flowering stalks are 6 to 24 inches in length and terminate in a compound inflorescence or head that contains 100 to 300 ray flowers (Figure 4). Each ray flower has a strap-shaped yellow petal (Figure 5) with five notches at the tip. Dandelion flowers are not normally pollinated, but develop asexually. Flowering occurs nearly year-round in the temperate climatic regions of California.

Figure 2. Dandelion plant, showing taproot.

The seeds are achenes (dry fruits that contain one seed) and are about ⅛ inch in length with five to eight ribs (Figure 6). At the apex of the achene there is a slender stalk (about two to four times the length of the achene) that terminates in a parachute-like structure (pappus). With the pappus facing out,

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Revised based on a previous version authored by DW Cudney and CL Elmore.

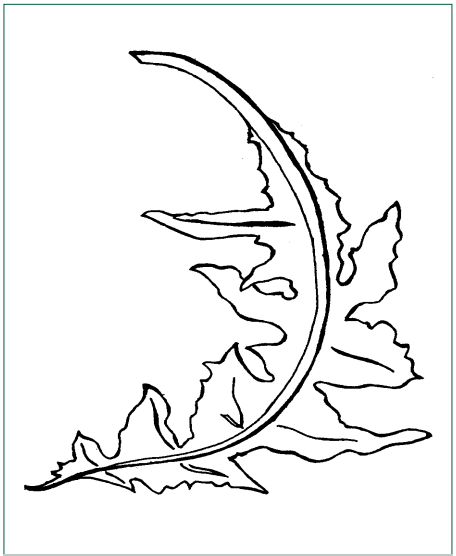

Figure 3. Deeply serrated dandelion leaf margin.

Figure 4. Flowering dandelion plants.

these achenes form the characteristic puffball (Figure 7), allowing the seed to be transported via wind currents for miles.

Seed germination occurs at or very near the soil surface. Seeds germinate throughout the growing season when soil is moist and soil temperature is at least 50°F. However, germination is more rapid when the soil temperature is closer to 77°F. Light increases germination. The seedling stage (Figure 8) can last 8 to 15 weeks, depending on temperature and growing conditions. Seedling growth is slower in cold weather.

Flowering begins early and continues throughout the life of the plant. Dandelion plants can survive for many years,

Figure 5. Ray flowers of California dandelion, *Taraxacum californicum*.

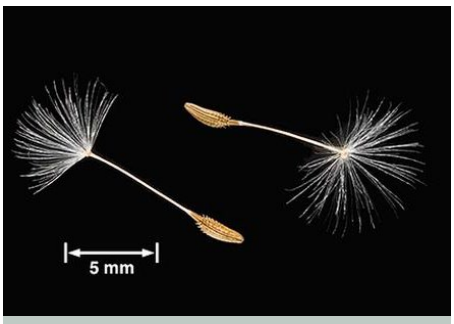

Figure 6. Dandelion achenes.

developing massive, thickened crowns 6 to 10 inches across. These perennial plants are well adapted to irrigated areas such as in turfgrass, pastures, or other crops where frequent mowing or grazing is practiced.

IMPACT

Dandelions can form a dense mat of leaves (6 to 14 inches in diameter), that can crowd out desirable species and reduce the vigor of those plants that survive. In turf, it forms clumps that cause poor footing for athletic fields and golf courses. Dandelion's texture and color vary from that of turfgrass, and the yellow flowers reduce the aesthetic quality of the lawns and other turf areas. Dandelion flowers may attract bees, which can be problematic where children or people with bee allergies are present.

Figure 7. Dandelion plants at fruiting stage.

Figure 8. Dandelion seedlings.

MANAGEMENT

Removing dandelions by hand-pulling or hoeing is usually futile, unless done repeatedly over a long period of time, because of the deep tap root system of established plants. Control by this method is most successful in home lawns and small gardens. Turfgrass and ornamental areas should be well maintained for maximum vigor, making them as competitive as possible to slow dandelion infestations. Dandelion seeds can be moved by equipment or become windborne and travel several miles, making prevention of new infestations very difficult. Dense stands of turfgrass and ornamentals shade the soil surface, reducing the establishment of new dandelion seedlings.

Solitary new dandelion plants along fence rows, roadsides, flower beds, and in turfgrass should be grubbed out (removed by digging out the entire plant, taproot and all) before they produce seed. Dandelion knives (Figure 9) and similar specialized tools are available for removing individual weeds and

their roots while minimizing soil disturbance. Monitor the area for several months to make sure that removal of the taproot was complete.

Watch the short UC IPM video "How to Remove Dandelions" at youtu.be/FcBtWyHfzKg which discusses various tools and considerations for removing dandelions by hand.

Lawns and Turfgrass

No single control procedure has been successful in controlling dandelion in turfgrass. Early grubbing of new seedlings should be practiced diligently and regularly for several years to successfully reduce the dandelion population.

Many broadleaf weeds may be controlled with mowing by cutting off the growing points and upright parts of the plant, which may lead to drying out and eventual death, but this is NOT true of dandelion. Because it grows from a basal rosette that is lower than a mower blade can reach, mowing will have no effect on control.

Spot-spraying isolated plants with translocated herbicides (glyphosate, triclopyr, 2,4-D, dicamba, MCPA, mecoprop, and others) (Table 1) can be helpful. Glyphosate is a nonselective herbicide that will kill turfgrass, leaving open areas, while the others will not injure most grass species. Triclopyr should not be used on Bermudagrass or other warm-season turf species. Overseed any open spots with grass seed similar to the existing turf species to reestablish a vigorous lawn.

Two herbicides—carfentrazone, a conventional broadleaf herbicide, and iron HEDTA, a product classified as a biopesticide (although not organic)—have both shown promise for quick burndown and control of small dandelion seedlings.

Some preemergence herbicides such as those containing dithiopyr or isoxaben have been effective in managing dandelions. Like all preemergence herbicides, these must be applied to the soil before the seeds germinate.

Figure 9. A dandelion knife can be used to remove weeds.

Landscape Plantings

There are few options for the control of dandelions in ornamental landscape plantings. Prevention, such as the use of mulch, is very important. Mulching with landscape fabrics can

Table 1. Summary of Herbicides for Dandelion Control.

Site	Material	Applied to Soil Before Germination (preemergence)	Applied to Young Plants (postemergence)	Readily Available to Home Gardeners
Lawns and Turfgrass	glyphosate	no	yes	yes
	isoxaben	yes	no	yes
	2,4-D*	no	yes	yes
	dicamba*	no	yes	yes
	triclopyr	no	yes	yes
	MCPA*	no	yes	yes
	mecoprop*	no	yes	yes
	carfentrazone*	no	yes	yes
	iron (Fe) HEDTA	no	yes	yes
	corn gluten meal	yes	no	yes
Landscape Plantings	isoxaben	yes	no	no
	oxyfluorfen	yes	no	no
	indaziflam*	yes	no	yes
	acetic acid	no	yes	yes
	fatty acids (soaps)	no	yes	yes
	natural oils	no	yes	yes

*Usually available to homeowners in ready-to-use combinations with one or more postemergence herbicides.

be particularly effective for controlling seedlings, reducing the amount of light that is able to reach the soil. Use a polypropylene or polyester fabric or black polyethylene (plastic tarp) to block all plant growth. Fabric mulches should be covered with mulch (wood chips, bark, or other materials) to improve aesthetics and to reduce photodegradation.

Mulches such as wood chips or bark may also be effective if they are maintained at a depth of at least 3 inches deep. If these materials are used without a landscape material, additional wood chips will need to be added as the mulch layer breaks down over time. Organic materials, such as wood chips, will break down and provide a growth medium for new dandelion seedlings if not properly maintained.

Spot treatment of solitary plants with a postemergence herbicide can often save time and money. Frequent hand-pulling or hoeing is helpful if done during the year, but regrowth from the extensive perennial root system limits the effectiveness of this method.

The preemergence herbicides (see Table 1) isoxaben, indaziflam, and oxyfluorfen applied to the soil before dandelion seeds germinate have been useful in limiting infestations. Because of dandelion's extended germination period, the area must be monitored regularly to determine when the herbicide must be reapplied.

If isoxaben or indaziflam are used without postemergence herbicides, be sure to remove all existing dandelions and lightly hoe any seedlings that emerged after the application. If oxyfluorfen is used, do not disturb the soil after application.

Many home gardening products combine these preemergence herbicides with postemergence herbicides that can kill young dandelion plants, but will only temporarily "knock down" established perennial dandelions, which in most cases survive.

Many forms of organically accepted products are now available. All of these products are contact herbicides and will only affect the part of the plant directly sprayed. Many of these products are botanically based oils (e.g., clove oil, eugenol, and d-limonene), or fatty acid soaps (e.g., pelargonic acid and nonanoic acid), or acetic acid. These products control weeds by destroying the leaf cuticle or causing cell leakage that rapidly leads to plant death. They may control small dandelions but will not control established perennial plants and have no residual (lasting) activity so seeds that germinate after application will not be controlled.

Many residents have tried vinegar to control dandelion and other weeds. Household vinegar is usually 5% acetic acid and is not effective in killing dandelion, nor is it designed to be used as a pesticide. It is important to note that many of the commercial horticultural (herbicidal) vinegar products available in stores and online are sold at a concentration of 20% acetic acid and carry a DANGER signal word to indicate its potential for acute toxicity when a person is exposed.

To be effective, commercial herbicidal vinegar products should be used at full strength (not diluted) and handled with extreme care. It is very important to wear eye protection and gloves when using the herbicidal form of acetic acid. As with any pesticide, always read the product label carefully and follow the instructions.

Few postemergence herbicides are registered for use in established ornamental plantings. Spot treatment with the postemergence herbicides listed above can control existing dandelion plants, but do not allow the spray or drift to contact desirable plants or injury will result. Do not use any herbicide unless the label instructions allow it.

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WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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