

Biology and Control of Flax-Leaved Fleabane in Trees and Vines

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Flax-leaved fleabane or hairy fleabane (*Conyza bonariensis*) is a common weed found infesting thousands of acres of orchards and vineyards throughout California. Preliminary observations suggest that flax-leaved fleabane populations have increased in recent years. With poor economic returns in recent years (particularly in the south Central Valley), some growers have reduced weed control inputs to help save costs. This may, in part, explain the noticeable increase of this weed throughout the state. To prevent its spread, it is essential to understand the biology of this weed and some management strategies.

Biology

Flax-leaved fleabane is a summer annual weed that is native to South America. It belongs to the Asteraceae (sunflower) family. Its seeds germinate from late fall to spring. Under certain environmental conditions, it overwinters and behaves like a biennial. The plant usually matures from July to September in the Central Valley and is often found growing in the same areas as horseweed (*C. Canadensis*). The cotyledons or seed leaves of flax-leaved fleabane are dull green, oval, and covered with fine, short hairs. At the early stages of growth, flax-leaved fleabane looks very similar to horseweed. The true leaves are light green to dull green and may appear crinkled, compared to horseweed, which has darker green leaves.

Young plants have narrow leaves with slightly toothed-shaped margins. The leaves often have very short stalks, or more commonly, are stalkless. Mature plants are multi-branched, without a main stem and are from 1½ to 3 feet tall. The stem is smooth or covered with shaggy hairs. The plant has small, yellowish flower heads at the end of the branched stems. The mature flowering heads are rounded, about ½” in diameter and when mature, contain from 50 to 200 seeds each.

Flax-leaved fleabane grows readily in orchards, vineyards, and waste areas. It competes severely for water, and grows and spreads rapidly. The main reason for its rapid spread is its ability to be readily disseminated by wind. The seeds have attached pappus (tiny hairlike bristles) that is easily carried by wind. This dispersal mechanism helps its seeds to travel great distances (much like dandelions) and establish themselves elsewhere. Another reason for its rapid spread is that its seeds do not have to undergo dormancy to sprout. Once mature, they can begin to germinate. It can also spread rapidly from field margins. A single plant can produce 10,000 or more seeds.

Like horseweed, this weed prefers undisturbed situations, such as tree or vine rows, where the seeds that are on the soil surface can easily germinate. The seeds generally do not survive for more than 3 years under most conditions.

Problems associated with control

In recent years, poor economic returns for grapes, especially raisin grapes, have led to abandonment of numerous vineyards in the South Central Valley. Other growers have reduced weed control measures to save operation costs. This phenomenon may have led to the more recent increase in the occurrence of flax-leaved fleabane in these vineyards. As long as these weeds are allowed to go to seed, its prevalence may keep increasing in the future. It is said that ‘one year’s seeding is worth seven years weeding’ and this certainly applies to flax-leaved fleabane.

Control strategies

The critical first step to limit the spread of flax-leaved fleabane is to prevent it from producing seeds. It is more easily controlled at an early stage (seedling and rosette stage) than at later stages when the plant becomes somewhat woody. Therefore, chemical or mechanical control measures should be used before this weed becomes too large. Table 1 shows a list of herbicides currently registered in California for flax-leaved fleabane control in orchards and vineyards. Always refer to the appropriate label for recommendations for effective weed control.

Pre-emergence herbicides with soil residual activity can help control flax-leaved fleabane before they emerge. If some plants have emerged by the time of soil treatment, the addition of a post-emergence herbicide as a tank-mix partner is recommended. Adequate rainfall is needed within a certain amount of days following treatment (refer to label).

Since flax-leaved fleabane has a large window for time of emergence, it is often difficult to predict the best time to apply post-emergence herbicides for maximum control of seedlings. Several timely sprays are usually required during the season for adequate control. For best degree of control, it is important to treat this weed when it is in the seedling stage, prior to bolting. Although glyphosate controls this weed, timing of application influences the amount of herbicide needed for it to be effective (Table 2).

Table 1. Herbicide options for flax-leaved fleabane control in orchards and vineyards

Pre-emerge	Lb ai/A	Control	Post-emerge	Lb ai/A	Control
Bromacil	3.2	P	Diquat	0.375	P
Bromacil + Diuron	3.2	C	Glufosinate	1.0	C
Diuron	2.4	P	Glyphosate	1.0	C
EPTC	2.1	P	Oxyfluorfen	0.25	P
Isoxaben	0.5	C	Paraquat	0.6	P
Norflurazon	2.0	P	Sulfosate	1.0	C
Oxyfluorfen	1.0	P	2,4-D amine	1.4	C
Simazine	2.0	C	Oxyfluorfen + 2,4-D amine	0.125 1.4	C
Thiazopyr	1.0	P			
Diuron + Simazine	1.5 1.5	C			

C = effective control and P = partial control

Table 2. Flax-leaved fleabane control at varied growth stages and herbicide rates

Flax-leaved fleabane growth stage	Lb ai/A for effective control (>95%)
3 – 6 leaf	0.5
7 – 12 leaf	1.0
13 – 19 leaf	1.5
21 – 21 leaf	2.0
>25 leaf	2.0 (poor control)

Data by Dr. Tim Prather, UC KAC, Parlier, CA, 1999

A study was conducted in a grape vineyard in Fresno County during 2003 to determine the effect of glufosinate (Rely), a relatively new contact-type, post-emergence herbicide, on flax-leaved fleabane control, when compared to current standard post-emergence herbicides. Rely was tested at 1 and 1.5 lb ai/A in a total volume of 20 and 40 gpa. Standard post-emergence herbicides (Roundup UltraMax, Touchdown IQ, and Gramoxone Extra) were included in the trial at recommended rates and at similar volume mixes. The treatments were applied to small plots, replicated four times each in a randomized complete block design. Treatments were applied in May when flax-leaved fleabane was from 5” to 14” tall. A CO₂ backpack sprayer was used to deliver the treatments using two flat fan nozzles per pass.

Rely outperformed all the other treatments tested (Table 3). It was shown that control was best achieved when Rely was applied at 1 to 1.5 lb ai/A in a spray volume of 40 gpa. While Gramoxone Extra provided statistically similar results, it was less effective, and Roundup UltraMax and Touchdown IQ did not provide effective control. Reducing the volume of water resulted in slightly lower weed control.

Table 3. Flax-leaved fleabane control

Treatment	Lb ai/A	Total gpa/A	Control 21 DAT	Control 55 DAT
Rely*	1.0	20	9.5 a	9.4 a
Rely*	1.5	20	9.8 a	9.7 a
Roundup Ultra*	1.0	20	6.3 c	6.0 c
Touchdown IQ*	1.0	20	5.3 d	6.0 c
Gramoxone Extra**	1.9	20	9.6 a	9.3 a
Rely*	1.0	40	9.9 a	9.8 a
Rely*	1.5	40	9.9 a	9.9 a
Roundup Ultra*	1.0	40	6.5 c	7.8 b
Touchdown IQ*	1.0	40	8.3 b	6.5 c
Gramoxone Extra**	1.9	40	9.6 a	9.4 a
Statistical notation @ p=0.05 CV: LSD:			4.17% 0.56	4.74% 0.63

*Ammonium sulfate added at 5 lb/100 gal and **Non-ionic surfactant added at 0.25% v/v
DAT = days after treatment

Tillage is also useful for controlling flax-leaved fleabane if properly timed. Using specialized mechanical equipment (weed blades, hoe plows, tillers, disks, and others) within the tree and vine rows can provide adequate control of flax-leaved fleabane as long as they are in the seedling

stage, prior to bolting. Mowing is not a viable option for control, since mowing tends to stimulate lateral bud sprouting from near the base of the plant. This can harden off plants, making it nearly impossible to control with post-emergent sprays. Although there has been some success with control through flaming, it often requires follow-up applications when they are in the seedling stage of growth.

Flax-leaved fleabane appears in more orchards and vineyards than ever before. To help resolve this ongoing situation, growers need to be aware of the issues contributing to this problem. Early recognition of this weed within fields, along field edges and borders, and along property fence lines, preventing new seeds from being produced, using timely herbicide and mechanical options, and rotating control strategies are all essential steps needed for the long-term management of flax-leaved fleabane.