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Weed and Sucker Management in Hops

Many broadleaf and grassy weeds and sedges compete with young as well as established hops for water, nutrients, light, and space. Broadleaf weed management in hops largely relies on the use of preemergence herbicides. Very few postemergence herbicides are available for selective control of broadleaf weeds within hop rows. Timely control of the sucker mat is very important to minimize the potential for disease occurrence, especially the downy and powdery mildews of hops. Suckers if not controlled, will create an ideal environment for disease development. This publication discusses currently available pre- and post-emergence herbicides for weed and sucker control in hops.

A. Preemergence Weed Control

1. Flumioxazin

Common name: Chateau SW

Application rate: 6 oz/a

Usage: Do not apply more than 6 oz/a Chateau SW per growing season. Apply Chateau at 6 oz/a as a 1 to 1.5-foot band to each side of the row of DORMANT hops from November through February or until the hops are dormant. Addition of an additive may cause serious injury to hops. To control emerged weeds, tank mix with a labelled burndown herbicide such as paraquat or glyphosate. Avoid contact with green stems (unless used for sucker control), foliage, flowers or cones or unacceptable injury may occur. Do not spray within 30 days of harvest. For weeds controlled by Chateau SW, refer to table 1.

2. Indaziflam

Common name: Alion

Application rate: 3.5 to 5 fl oz/a

Usage: Apply to hops that have been established for at least one year. Apply to DORMANT hops in late fall or early spring to hop shoots that are in the bud stage up to 2 inch in height. Apply as a 2-foot band on each side of the row. A maximum of two applications, each at 5 fl oz can be made per year per acre. Do not use in hops grown on sandy soils or soils with 20 % or higher gravel. On soils with <1% organic matter use 3.5

floz/a/application and do not exceed 7 floz/a/year. On soils with 1% or higher organic matter use 5 floz/a/application and DO NOT exceed 10 floz/a/year. For weeds controlled by Alion, refer to table 1.

3. Norflurazon

Common name: Solicam DF

Application rate: 2.5 to 5 lb/a

Usage: Apply 6 or more months after crop establishment as a directed spray to soil on each side of row. For hops growing on coarse textured soils (sand, loamy sand, sandy loam), use 2.5 lb/ treated acre. On medium textured soils (loam, silt loam, silt, and sandy clay loam) use 3.75 lb/treated acre. On heavy textured soils (sandy clay, clay loam, silty clay loam, silty clay, clay) use 5 lb/ treated acre. Pre-harvest interval is 60-day. For weeds controlled by Solicam DF, refer to table 1.

4. Pendimethalin

Common name: Prowl H2O

Application rate: 1.1 to 4.2 qt/a

Usage: Apply to hops in year of planting or to established hops. Apply to dormant or vegetative hop plants before weeds emerge. Avoid contact with vines or cones. A second application may be made 30 days after the first application. Do not exceed a maximum seasonal rate of 4.2 qt/a. Pre-harvest interval is 90 days. For weeds controlled by Chateau Prowl H2O, refer to table 1.

5. Trifluralin

Common name: Trifluralin 4 EC, Treflan 4L

Application rate: 1 to 1.5 pint/a

Usage: Apply and incorporate in established DORMANT hops only. Do not spray or till over top of crowns. Trifluralin will not control weeds in the aster or mustard families. For hops growing on coarse textured soils (sand, loamy sand, sandy loam), use 1.0 pt/a. On medium textured soils (loam, silt loam, silt, and sandy clay loam) use 1.25 to 1.5 pt/a. On heavy textured soils (sandy clay, clay loam, silty clay loam, silty clay, clay) use 1.5 pt/a. On soils with 2% or higher organic matter, use 1.5 pt/a. For weeds controlled by Trifluralin, refer to table 1.

B. Postemergence Weed Control

1. 2, 4-D

Common name: Weedar 64, 2,4-D Amine 4

Application rate: 1 pt/a

Usage: Apply as a directed spray in ROW MIDDLES for postemergence annual broadleaf weed control. Up to 3 applications, each at 1 pt/a may be made per crop cycle with 30 days interval between applications. Pre-harvest Interval is 30 days.

*Clean out the sprayer properly after application of 2, 4-D. Label provides the sprayer cleanup directions.

2. Carfentrazone

Common name: Aim EC

Application rate: 0.5 to 2 fl oz/a

Usage: For preplant burndown and annual broadleaf control. As a preplant burndown treatment, apply Aim EC at 2 fl oz/a to actively growing weeds less than 4-inch in height and biennial or perennial weed rosettes less than 3-inch in diameter. Use high spray volumes to adequately cover the weed foliage. Apply burndown treatment no later than 1 day prior to transplanting hops. For broadleaf weed control between and within hop rows, add a non-ionic surfactant or crop-oil-concentrate (consult product label). Use a hooded or shielded sprayer to avoid contact with hops else unacceptable injury may occur. Effective against very small broadleaf weeds. DO NOT APPLY more than 7.6 fl oz/a/year. Allow a minimum of 14 days interval between two applications. Pre-harvest Interval is 7 days.

3. Clethodim

Common name: Select Max, Intensity

Application rate: 9 to 16 fl oz /a

Usage: For control of annual and perennial grasses only. Apply to actively growing weeds less than 6-inch in height. Use higher rate (16 fl oz/a) for perennial weeds. Add a non-ionic surfactant or crop-oil-concentrate (consult product label). Do not exceed a yearly maximum of 64 fl oz/a. Pre-harvest Interval is 21 days.

4. Clopyralid

Common name: Spur

Application rate: 0.33 to 0.67 pt/a

Usage: For control of Canada thistle and other composite weeds. Apply to weeds before bud stage. May cause minor leaf cupping of hops. Maximum 2 applications, each at 0.33 pt/acre may be made spaced apart by 21 days or a single application at 0.67 pt/a/year. Pre-harvest Interval is 30 days.

5. Glyphosate

Common name: Roundup PowerMax

Application rate: 1 to 3 pt/a

Usage: Apply in ROW MIDDLES to control emerged annual and perennial weeds. Do not allow spray to contact hop plant or suckers. Avoid contact with hop plants. Add non-ionic surfactant (consult product label). Pre-harvest Interval is 14 days.

6. Pelargonic acid

Common name: Scythe

Application rate: 5 to 10 gal/a

Usage: For preplant burndown, postemergence vegetation control, and sucker control. As a preplant burndown treatment to control annual weeds, use 3 to 5% (2.5 pints to 2 quarts in 10-gallon water) solution. For controlling biennial and perennial weeds, use 5 to 7% (2 to 2.75 quarts in 10-gallon water) solution of Scythe in 75 to 200 gallon solution per acre.

For postemergence control of annual, biennial, and perennial broadleaf weeds and grasses in ROW MIDDLES, apply 3 to 7.5% solution using 75 to 200 gallons spray volume per acre. Avoid contact with hop plants or unacceptable injury can occur.

C. Burndown Treatment for Sucker Control:

1. Flumioxazin

Common name: Chateau SW

Application rate: 6 oz/a

Usage: Apply Chateau at 6 oz/a only when hops have reached a minimum height of 6 feet. Direct application to the lower 2 feet of the hops and to the sucker mat which extends from the base of plant to 1.5 to 2 feet into the row. Apply before suckers become woody.

2. Carfentrazone

Common name: Aim EC

Application rate: 0.5 to 2 fl oz/a

Usage: apply 2 fl oz/a in a minimum of 20 gallons of spray solution to the basal portion of the hop plants (lower 1.5 ft of plants) and to the sucker mat which extends from the base of plant to 1.5 to 2 feet into the row. Add a non-ionic surfactant or crop-oil-concentrate (consult product label). Apply before suckers become woody.

3. Pelargonic acid

Common name: Scythe

Application rate: 5 to 10 gal/a

Usage: Apply 5 to 7 % (2 to 2.75 quarts in 10-gallon water) solution to the basal portion of the hop plants (lower 1.5 ft of plants) and to the sucker mat which extends from the base of plant to 1.5 to 2 feet into the row. Apply before suckers become woody.

The mentioning of trade names in this publication is solely for the purpose of providing specific information. The CAES does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.

For weed identification, visit the following websites:

- ❖ University of Illinois Weed Science: <http://weeds.cropsci.illinois.edu/weedid.htm>
- ❖ University of Missouri Weed Science: <https://weedid.missouri.edu/>
- ❖ Ohio perennial and biennial weed guide: https://www.oardc.ohio-state.edu/weedguide/list_weeds.php?st=0

Table 1: Weed Control Efficacy of Preemergence Herbicides Registered in Hops.

Weed Species	Alion	Cheateu SW	Prowl H2O	Solicam DF	Treflan 3EC
Annual Bluegrass	√	√	√	√	√
Annual Sowthistle	√	.	.	√	.
Barnyardgrass	√	√	√	√	√
Black Mustard	√	.	√	√	.
Black Nightshade	.	√	.	.	.
Carpetweed	√	√	√	√	√
Cheat	√	√	√	.	√
Cheeseweed /Mallow	√	.	.	√	.
Cocklebur*	.	.	.	√	.
Common Chickweed	√	√	√	√	√
Common Groundsel	√	√	.	√	.
Common Lambsquarters	√	√	√	√	√
Common Purslane	√	√	√	√	√
Common Ragweed	√	√	.	√	.
Dayflower	.	.	.	√	.
Dodder*	.	.	√	.	√
Downy Brome	√	√	√	√	√
Eastern Black Nightshade	.	√	.	.	.
Eclipta	.	√	.	.	.
Fall Panicum	√	√	√	.	√
False Chamomile	.	√	.	.	.
Field Bindweed*	.	√	.	.	√
Field Sandbur			√	√	√
Giant Foxtail	√	√	√	√	√
Goldenrod*			.	√	.
Goosegrass	√	√	√	√	√
Green Foxtail	√	√	√	.	√
Hairy Fleabane	√	.	.	√	.
Hairy Nightshade	.	√	.	.	.
Horseweed	√	√	.	√	.
Junglerice	√	√	√		√
Jim Hill Mustard	.	.	.	√	.
Jimsonweed	.	√	.	.	.
Kochia	√	√	√	√	√
ladysthumb	.	√	√	.	.
Large Crabgrass	√	√	√	.	√
Little Mallow	√	√	.	√	.
Lovegrass	.	√	√	.	√
Marestail	√	√	.	√	.

Mouseear Chickweed	√	√	.	.	.
Pennsylvania Smartweed	√	√	√	√	.
Pineappleweed	.	.	.	√	.
Prostrate Pigweed	√	.	√	√	√
Prostrate Spurge	√	.	.	√	.
Purple Cudweed	√	.	.	√	.
Red Sorrel	√
Redroot Pigweed	√	√	√	√	√
Rice Flatsedge	.	√	.	.	.
Sandbur, Field/Longspine	.	.	.	√	√
Smooth Crabgrass	√	√	√	.	√
Smooth Pigweed	√	√	√	.	√
Spotted Spurge	√	√	.	√	.
Stinkgrass	√
Tumble Mustard	.	√	.	√	.
Tumble Pigweed	.	√	√	√	√
Velvetleaf	√	√	√	√	.
Wild Mustard	√	√	.	.	.
Witchgrass	.	.	√	√	.
Yellow Foxtail	√	√	√	.	√
Yellow Nutsedge*	.	.	.	√	.

*Control of plants arising from seeds only.