

Weed Management in Tomato¹

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Although weed control has always been an important component of tomato production, its importance has increased with the introduction of the sweet potato whitefly and development of the associated irregular ripening problem. Increased incidence of several viral disorders of tomatoes also reinforces the need for good weed control. Common weeds, such as the difficult-to-control nightshade, and volunteer tomatoes (considered a weed in this context) are hosts to many tomato pests, including sweet potato whitefly, bacterial spot, and viruses. Control of these pests is often tied, at least in part, to control of weed hosts. Most growers concentrate on weed control in row-middles, and peripheral areas of the farm may be neglected. Weed hosts and pests may flourish in these areas and serve as reservoirs for reinfestation of tomatoes by various pests. Thus, it is important for growers to think in terms of weed management on the entire farm, not just the actual crop area.

Total-farm weed management is more complex than row-middle weed control because several different sites and possible herbicide label restrictions are involved. Often, weed species in row middles differ from those on the rest of the farm, and this might dictate different approaches. Sites other than row middles include roadways, fallow fields, equipment parking areas, well and pump areas, fencerows and associated perimeter areas, and ditches.

Disking is probably the least expensive weed control procedure for fallow fields. Where weed growth is mostly grasses, clean cultivation is not as important as in fields infested with nightshade and other disease and insect hosts. In the latter situation, weed growth should be kept to a minimum throughout the year. If cover crops are planted, they should be plants that do not serve as hosts for tomato diseases and insects. Some perimeter areas are easily disked, but berms and field ditches are not. Some form of chemical weed control may have to be used on these areas. Bare ground on the farm can lead to other serious problems, such as soil erosion and sandblasting of plants. However, where undesirable plants exist, some control should be practiced, if practical, and replacement of undesirable species with less troublesome ones, such as bahiagrass, might be worthwhile.

Certainly fencerows and areas around buildings and pumps should be kept weed free, if for no other reason than safety. Herbicides can be applied in these situations, provided care is exercised to keep them from drifting onto the tomato crop.

Field ditches and canals present special considerations because many herbicides are not labeled for use on aquatic sites. Where herbicidal spray may contact water and be in close proximity to tomato plants, for all practical purposes,

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growers probably would be wise to use Diquat only. On canals where drift onto the crop is not a problem and weeds are woodier, Rodeo[®], a systemic herbicide, could be used. Other herbicide possibilities exist, as listed in Table 1. Growers are cautioned against using Arsenal[®] on tomato farms because tomatoes are very sensitive to this herbicide. Particular caution should be exercised if Arsenal[®] is used on seepage-irrigated farms because it has been observed to move in some situations.

Use of rye as a windbreak is a common practice in the spring; however, in some cases, it can have adverse effects. If undesirable insects, such as thrips, build up on the rye, contact herbicide can be applied to kill the rye, eliminating it as a host, while the remaining stubble continues to serve as a windbreak.

The greatest row-middle weed problem confronting the tomato industry today is nightshade. Nightshade has developed varying levels of resistance to some postemergence herbicides in different areas of the state. Best control with postemergence (directed) contact herbicides is obtained when the nightshade is 4–6 in. tall, rapidly growing, and not stressed. Two herbicide applications in about 50 gal. per acre, using a good surfactant, is usually necessary.

With postdirected contact herbicides, several studies have shown that gallonage above 60 gal. per acre actually dilutes the herbicides and therefore reduces efficacy. Good leaf coverage can be obtained with volumes of 50 gal. or less per acre. A good surfactant can do more to improve the wetting capability of a spray than increasing the water volume. Many adjuvants are available commercially. Some adjuvants contain more active ingredient than others, and herbicide labels may specify a minimum active ingredient rate for the adjuvant in the spray mix. Before selecting an adjuvant, refer to the herbicide label to determine the adjuvant specifications.

Postharvest Vine Desiccation

Also important is good field sanitation with regard to crop residue. Rapid and thorough destruction of tomato vines at the end of the season has always been promoted; however, this practice takes on new importance with the sweet potato whitefly. Because of foliar interception of spray droplets, good canopy penetration of pesticidal sprays is difficult with conventional hydraulic sprayers once the tomato plant develops a vigorous bush. In the spring of 1989, the sweet potato whitefly population on commercial farms was observed to begin a dramatic, rapid increase about the time of first harvest. This increase appears to continue until

tomato vines are killed. It is believed this increase is due, in part, to coverage and penetration. Thus, it would be wise for growers to continue spraying for whiteflies until the crop is destroyed and to destroy the crop as soon as possible with the fastest means available. Gramoxone[®] is labeled for postharvest desiccation of tomato vines. Follow the label directions.

The importance of rapid vine destruction cannot be overstressed. Merely turning off the irrigation and allowing the crop to die will not do; application of a desiccant followed by burning is the prudent course.

Table 1. Pretransplant chemical weed controls in tomato

Active ingredient lb. a.i./A	(Trade name) amount of product/A	MOA code	Weeds controlled / remarks
Carfentrazone Up to 0.031	(Aim [®]) 2 EC or 1.9 EW Up to 2 fl. oz.	14	Apply as a preplant burndown for emerged broadleaves up to 4 in. tall or rosettes less than 3 in. across. Good coverage is essential. A NIS, MSO, or COC is recommended. No pretransplant interval.
EPTC 2.6	(Eptam [®]) 7 E 3 pt.	8	Annual broadleaf, annual grass weeds, and yellow/purple nutsedge. Labeled for transplanted tomatoes grown on low-density mulch. Do not use under high-density, VIF, or metallized mulches. Do not transplant until 14 days after application. A 24c special local needs label for Florida. PHI 14 days.
Flumioxazin Up to 0.128	(Chateau [®]) 51 WDG Up to 4 oz.	14	Annual broadleaf weeds. Apply to row-middles of raised, plastic-mulched beds that are at least 4 in. higher than the treated row-middle and 24 in. bed width. Label is a Third-Party Registration (TPR, Inc.). Use without a signed authorization and waiver of liability is a misuse of the product. Tank mix with a burndown herbicide to control emerged weeds. 0 day pretransplant interval.
Fomesafen 0.25–0.38	(Reflex [®]) 2 SC 1–1.5 pt.	14	Broadleaves and suppression of yellow/purple nutsedge. Suppression of some annual and perennial grasses. Label is a 24(C) local indemnified label and a waiver of liability must be signed for use. Transplanted crop only. May be applied to bareground production or to plastic mulched beds following bed formation but prior to laying plastic. Use shields or hooded sprayers if applying to row-middles and prevent contact with the plastic mulch. 7 and 0 day pretransplant interval on bareground and plastic mulch, respectively. PHI 70 days.
Glyphosate 0.3–1.0	(Various formulations) Consult labels	9	Emerged broadleaf and grass weeds and nutsedge. Apply as a preplant burndown. Consult label for individual product directions.
Halosulfuron 0.024–0.05	(Sanda [®] , Profine [™]) 75 DG 0.5–1 oz.	2	Broadleaf control and yellow/purple nutsedge. Do not exceed 2 applications of halosulfuron per 12 month period. 7 day pretransplant interval. PHI 30 days.
Imazosulfuron 0.19–0.3	(League [™]) 0.5 DF 4–6.4 oz.	2	Broadleaf weeds and nutsedge. Apply pretransplant just prior to installation of plastic mulch. 1 day pretransplant interval. PHI 21 days.
Lactofen 0.25–0.5	(Cobra [®]) 2 EC 16–32 fl. oz.	14	Broadleaf weeds. Label is a Third-Party Registration (TPR, Inc.). Use without a signed authorization and waiver of liability is a misuse of the product. Apply to row-middles only with shielded or hooded sprayers. Contact with green foliage or fruit can cause excessive injury. Drift of Cobra [®] -treated soil particles onto plants can cause contact injury. Limit of 1 PRE and 1 POST application per growing season. PHI 30 days.
S-metolachlor 1.0–1.3	(Brawl [™] , Dual Magnum [®] , Medal [®]) 7.62 EC 1.0–1.33 pt.	15	Annual broadleaf and grass weeds. Suppression of purple/yellow nutsedge. Apply to bed tops pretransplant just prior to laying the plastic. May also be used in row-middles. Research has shown that the 1.33 pt. may be too high in some Florida soils except in row-middles. PHI 30 days. PHI is 90 days if rate exceeds 1.33 pt./A.
Metribuzin 0.25–0.5	(Sencor, TriCor) 75 DF 0.33-0.67 lb. (Sencor, Metri) 4 F 0.5-1.0 pt.	5	Small emerged weeds less than 1 in. tall. Apply preplant in transplanted tomatoes only. Incorporate to a depth of 2-4 in. Maximum of 1.0 lb. a.i./A within a season. Avoid application for 3 days following cool, wet, or cloudy weather to reduce possible crop injury. PHI 7 day.
Napropamide 1.0–2.0	(Devrinol [®]) 50 DF 2–4 lb.	15	Annual broadleaf and grass weeds. For direct-seed or transplanted tomatoes. Apply to well-worked soil that is dry enough to permit thorough incorporation to a depth of 1–2 in. Incorporate same day as applied.
Oxyfluorfen 0.25–0.5	(Goal [®]) 2 XL 1–2 pt. (GoalTender [®]) 4 E 0.5–1 pt.	14	Broadleaves. Apply pretransplant just prior to installation of plastic mulch. 30 day pretransplant interval. Mulch may be applied any time during the 30-day interval.
Paraquat 0.5–1.0	(Gramoxone [®]) 2 SL 2.0–4.0 pt. (Firestorm [®]) 3 SL 1.3–2.7 pt.	22	Emerged broadleaf and grass weeds. Apply as a preplant burndown treatment. Surfactant is recommended.

Pelargonic acid	(Scythe [®]) 4.2 EC 3%–10% v/v		Emerged broadleaf and grass weeds. Apply as a preplant burndown treatment. Product is a contact, nonselective, foliar-applied herbicide with no residual control.
Pendimethalin 0.48–0.72	(Prowl [®] H ₂ O) 3.8 1.0–1.5 pt.	3	May be applied pretransplant to bed tops just prior to laying the plastic mulch or to row-middles. Do not exceed 3.0 pt./A per year. PHI 70 days.
Rimsulfuron 0.03–0.06	(Matrix [®] FNV, Matrix [®] SG, Pruvin [™]) 25 WDG 2.0–4.0 oz.	14	Annual broadleaf and grass weeds. Suppression of yellow nutsedge. Requires 0.5–1 in. of rainfall or irrigation within 5 days of application for activation. May be applied as a sequential treatment with a PRE and POST application not exceeding 0.06 lb. a.i./A in a single season. PHI 45 days.
Trifluralin 0.5	(Treflan [®] HFP, Trifluralin) 4 EC 1 pt. (Treflan [®] TR-10) 10 G 5 lb.	3	Annual broadleaf and grass weeds. Do not apply in Dade County. Incorporate 4 in. or less within 8 hr. of application. Results in Florida are erratic on soils with low organic matter and clay content. Note label precautions against planting noncrops within 5 months. Do not apply after transplanting.

Table 2. Posttransplant herbicides in tomato

Active ingredient lb. a.i./A	(Trade name) amount of product/A	MOA code	Weeds controlled / remarks
Carfentrazone Up to 0.031	(Aim [®]) 2 EC or 1.9 EW Up to 2 oz.	14	Emerged broadleaf weeds. Apply as hooded application to row-middles only. Good coverage is essential. A crop oil concentrate (COC) or nonionic surfactant (NIS) is recommended. May be tank mixed with other herbicides. PHI 0 days.
Clethodim 0.09–0.25 0.07–0.25	(Select [®] , Arrow [®]) 2 EC 6–16 fl. oz. (Select Max [®]) 1 EC 9–32 fl. oz.	1	Perennial and annual grass weeds. Use higher rates under heavy grass pressure or larger grass weeds. Use a COC at 1% v/v in the finished spray volume. NIS with Select Max [®] . PHI 20 days.
DCPA 6.0–7.5	(Dacthal [®]) W-75 8–10 lb. (Dacthal [®]) 6 F 8–10 pt.	3	Broadleaf and grass weeds. Apply to weed-free soil 6–8 weeks after crop is established and growing rapidly or to moist soil in row-middles after crop establishment. Note label precautions against replanting nonregistered crops within 8 months.
Diquat 0.5	(Reglone [®]) 2 EC 1 qt.	22	Broadleaf and grass weeds. Apply to row-middles only. Maximum of 2 applications per season. Nonionic surfactant recommended. PHI 30 days.
Halosulfuron 0.024–0.05	(Sanda [®] , Profine [™]) 75 DG 0.5–1 oz.	2	Small-seeded broadleaf and nutsedge. One over-the-top application 14 days after transplanting at 0.5–0.75 oz. product and/or postemergence application(s) of up to 1 oz. product to row-middles. Include an NIS. PHI 30 days.
Imazosulfuron 0.19–0.3	(League [™]) 0.5 DF 4–6.4 oz.	2	Broadleaf, grass, and nutsedge. Apply postemergence 3 to 5 days after transplant through early bloom. Only apply if no pretransplant application was made. Surfactant recommended. PHI 21 days.
Lactofen 0.25–0.5	(Cobra [®]) 2 EC 16–32 fl. oz.	14	Broadleaf weeds. Apply to row-middles only with shielded or hooded sprayers. Contact with green foliage or fruit can cause excessive injury. Drift of Cobra [®] —treated soil particles onto plants can cause contact injury. Limit of 1 PRE and 1 POST application per growing season. Do not apply within 18 days of transplanting. Surfactant recommended. PHI 30 days.
S-metolachlor 1.0–1.3	(Brawl [™] , Dual Magnum [®] , Medal [®]) 7.62 EC 1.0–1.33 pt.	15	Annual broadleaf and grass weeds and yellow nutsedge. Apply to row-middles. Label rates are 1.0–1.33 pt./A if organic matter is less than 3%. Use on a trial basis. PHI 60 days for rates of 1.67 pt. or less/A per year. PHI 90 days for rates of 1.68–2.0 pt./A per year.

Metribuzin 0.25–0.5	(TriCor [®] DF) 75 WDG 0.33–0.67 lb. (Tricor [™] , Metri [™]) 4 F 0.5–1 pt.	5	Small emerged weeds. Apply after transplants are established or direct-seeded plants reach the five to six true leaf stage. Apply in single or multiple applications with a minimum of 14 days between treatments. Maximum of 1.0 lb. a.i./A within a season. Avoid application for 3 days following cool, wet, or cloudy weather to reduce possible crop injury. PHI 7 days.
Paraquat 0.5	(Gramaxone [®]) 2 SL 2 pt. (Firestorm [®]) 3 SL 1.3 pt.	22	Emerged broadleaf and grass weeds. Direct spray over emerged weeds 1–6 in. tall in row-middles between mulched beds. Use an NIS. Use low pressure and shields to control drift. Do not apply more than three times per season. PHI 30 days.
Pelargonic acid	(Scythe [®]) 4.2 EC 3%–10% v/v	27	Emerged broadleaf and grass weeds. Direct spray to row-middles. Product is a contact, nonselective, foliar-applied herbicide with no residual control. May be tank mixed with several soil residual compounds.
Rimsulfuron 0.02–0.03	(Matrix [®] FNV, Matrix [®] SG, Pruvin [™]) 25 WDG 1.0–2.0 oz.	2	Broadleaf and grass weeds. May be applied as a sequential treatment with a PRE and POST application not exceeding 0.06 lb. a.i./A in a single season. Requires 0.5–1 in. of rainfall or irrigation within 5 days of application for activation. NIS or COC is recommended. PHI 45 days.
Sethoxydim 0.19–0.28	(Poast [®]) 1.5 EC 1.0–1.5 pt.	1	Actively growing grass weeds. A total of 4.5 pt./A can be applied in one season. Unsatisfactory results may occur if applied to grasses under stress. COC is recommended. PHI 20 days.
Trifloxysulfuron 0.0047–0.0094	(Envoke [®]) 75 DG 0.1–0.2 oz.	2	Broadleaf and yellow/purple nutsedge control. Direct spray solution to the base of transplanted tomato plants. Apply at least 14 days after transplanting and before fruit set. An NIS is recommended. PHI 45 days.

Table 3. Postharvest

Active ingredient lb. a.i./A	(Trade name) amount of product/A	Weeds controlled / remarks
Diquat 0.38	(Reglone [®]) 1.5 pt.	Apply after final harvest. Include a nonionic surfactant (NIS). Apply at 60–120 gal. of water/A. Complete coverage of the plant is required.
Paraquat 0.62–0.94	(Gramaxone [®]) 2 SL 2.4–3.75 pt. (Firestorm [®]) 3 SL 1.6–2.5 pt.	Broadcast spray over the top of plants after last harvest. Use an NIS. Thorough coverage is required to ensure maximum herbicide burndown. Do not use treated crop for human or animal consumption.