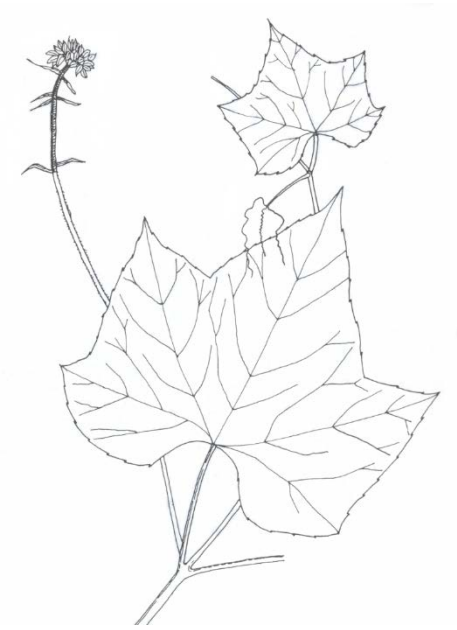
UNIVERSITY OF DELAWARE | Cooperative Extension
COLLEGE OF AGRICULTURE & NATURAL RESOURCES

Weed Facts
WF-4

Burcucumber Control in Cropland



Drawing from WEEDS OF THE NORTH CENTRAL STATES, University of Illinois Urbana-Champaign, Bulletin 773

Native to the northeastern United States, burcucumber (*Sicyos angulatus*) is a very competitive annual weed with a climbing-vine growth habit. The vines can reach lengths of 15 to 25 feet. The vining nature of this weed causes significant yield losses from competition; it covers plants, pulling them to the ground, and makes harvesting difficult.

Burcucumber leaves are thin, five-lobed, and up to 10 inches across. Leaves are borne on a stout pubescent petiole ranging from 1 to 4 inches long. Tendrils develop in the base of leaf petioles.

Branching vines can form from buds developing at the base of petioles. Also developing in leaf axils are green and white flowers that emerge in late summer and early fall. Female flowers develop into a fruit containing a single seed. Three to 15 fruits are borne in a cluster. The seeds are large (about 0.6 by 0.5 inch), dark brown to black in color, and enclosed in a hard seed coat (pericarp).

The hard and thick pericarp, which prevents seed germination by keeping moisture from entering, must be worn thin or broken to allow moisture in for seed germination. Four types of hairs cover the pericarp: barbed prickles, long jointed hairs, short pointed hairs, and single-celled hairs.

Temperature range for germination is 60 to 95° F; optimum temperatures are 75 to 85° F. In the field, burcucumber will germinate from mid-May through early September. Burcucumber germination is more sensitive to moisture stress than corn, requiring moist soils for high percentage of germination. As a result, burcucumber grows best along riverbanks, flood plains and edges of woods, but it will spread and grow in other locations. Plants can emerge from seeds up to 6 inches deep; a 1 to 4 inch depth is optimum.

PREVENTION

Burcucumber is a prolific seed producer. The seeds can be spread by many means. Of particular importance is its spread by seeds carried in crop harvesting equipment. Proper cleaning of equipment requires use of an air compressor, pressure hose, or sweeping. Running the equipment to clean itself out is not enough. Another means of infestation is the planting of soybean seed infested with burcucumber seeds. Burcucumber seeds are similar in size to soybeans and are difficult to remove in regular seed cleaning operations. Growers should buy certified seed; or if saving seed or buying

from a neighbor, they should be familiar with the fields where the seed was grown. Make sure the soybean seed is not contaminated with burcucumber seed. Burcucumber in field edges and roadsides can be a source of seed. Be sure weeds in areas outside the field are not permitted to produce seed.

CULTURAL AND MECHANICAL CONTROL

Cultural practices that result in a rapid, dense crop canopy will improve overall level burcucumber control. Since burcucumber will emerge throughout the summer until early fall, crop canopy is very important to prevent emergence and limit seed production of these late-emerging plants. Soybeans and sorghum planted in 15-inch rows (or less) will shade the ground earlier than 30-inch rows. Varieties with good early-season vigor will also improve crop competitiveness.

A thick layer of cover crop residue will help lower seedling density and seedling growth. Cover crop species with tissue resistant to decay (i.e. cereal rye, winter wheat or triticale) would be most beneficial. Delaying cover crop termination until shortly before planting will allow for maximum biomass production and more tissue resistant to decay.

Cultivation

Cultivation should be done in a manner to avoid bringing soil not treated with an herbicide near the soil surface, thereby increasing the opportunity for seeds to germinate and seedlings to emerge

Pursuant to the provisions of Title 3, Chapter 24 of Delaware Code, the Delaware Department of Agriculture under its Rules and Regulations has declared burcucumber a noxious weed. Designation as a noxious weed requires that burcucumber must be controlled.

A noxious weed is a plant that has adverse effects on or threatens agricultural production. A plant is designated as "noxious" by the U.S. or Delaware Departments of Agriculture. An attribute of a noxious weed is that it is difficult to control with many 'standard' weed control programs. Often fields infested with a noxious weed need special attention and require different management than non-infested fields.

Growers who have noxious weeds can call Todd Davis, noxious weed specialist, at Delaware Department of Agriculture to sign a compliance agreement. Failure to control this weed can result in fines of $25 per acre ($100 minimum).

Noxious weeds can be reported to Mr. Davis at 1-800-282-8685. He will contact the owner or agency to work on developing a control program. Noxious weeds also must be controlled on right-of-ways, lots and undeveloped lands as well as farmland.

CONTROL IN CORN

Good burcucumber control can be achieved in field corn. Control programs may consist of soil-applied atrazine followed by a postemergence herbicide program. Atrazine rate restrictions must be considered when planning herbicide programs that include atrazine and/or atrazine premixes.

Preplant or Preemergence Control

Apply atrazine preplant-incorporated or preemergence at labeled rates for the soil type. Prepackage mixtures containing atrazine such as Bicep II Magnum, Degree Xtra, Fultime, Guardsman Max, Harness Xtra, Keystone, Lexar, Lumax, or Acuron are readily available. A follow up with a postemergence herbicide may be needed to control escaped plants. Timely cultivation and hand

pulling may be equally effective when there are small numbers of uncontrolled weeds. Follow all herbicide label precautions.

Atrazine provides reasonable control, but because of burcucumber's very aggressive vining habit, one plant per square yard can seriously interfere with crop harvesting. To control burcucumber plants emerging after corn, choose one of the following programs.

Postemergence Control

The following table lists herbicides that can be used at labeled rates and according to label directions. Subsequent flushes of burcucumber may require multiple or split applications of some products or follow-up applications with other products. See labels for details.

When selecting a postemergence herbicide for burcucumber control, consider other weeds present in the field. Select an herbicide that will provide the broadest range of control for the weeds present.

		Corn growth stage maximum size or range				
Herbicide	**Herbicide Group**	**Broadcast**	**Directed**	**Maximum size**	**Rate/Acre**	**Efficacy rating[a]**
Accent Q[c]	2	V6 or 20 in	V10 or 36 in	3 in	0.67 oz	F-G
Steadfast Q[c]	2 + 2	V5 or 20 in	n/a	4 in	0.75 oz	F-G
Stout[c]	2 + 2	V5 or 16 in	n/a	3 in	0.75 oz	F-G
Northstar[c]	2 + 4	V6 or 4-20 in	20-30 in	4 in	5 oz	F-G
Yukon	2 + 4	spike to 36 in	n/a	12 in	6-8 oz	F
Banvel or Clarity	4	16 oz: 5 lvs or 8 in <8 oz: 36 in or 15 day pre-tassel	n/a	3 in	8 to 16 oz	F
Marksman	4 + 5	5 lvs or 8 in	n/a	❋	2 pt	G
Status	4 + 4	24 in at 4oz 4-10 in at 6 oz	up to 36 in at 4 oz	❋	4 to 6 oz	F-G
Atrazine	5	12 in	n/a	❋❋	2.4 pt	F-G
Resource	14	V2-V10	as needed	❋❋	6 oz	F-G
Glyphosate products[b]	9	V8 or 30 in	n/a	12 in	1 qt	E
Liberty[e]	10	through V5	n/a	6 in	22-32 oz	G
Callisto[c]	27	V8 or 30 in	n/a	5 in	3 oz	P-F
Impact or Armezon	27	up to 45 days pre-harvest	as needed	6 in	0.75-1 oz	F

❋ Indicates burcucumber is listed on the label, but no size information is given.

❋❋ Experience in the Mid-Atlantic region indicates activity with this herbicide, although burcucumber is not listed on the label. Treatment should be made before burcucumber is 4 inches tall.

[a]E = Excellent (>90% control) G-E = Good to Excellent G = Good (80-90% control) F-G = Fair to Good F = Fair (60-80% control) P-F = Poor to Fair P = Poor (20-60% control)

[b]Glyphosate is the active ingredient in all Roundup and Touchdown formulations. Glyphosate is also available under many other names and as part of numerous prepackaged mixtures. The rate given in the table is for glyphosate with a formulation of 4 lb ai (3 lb ae) per gallon. Adjust the rate for other formulations. All glyphosate products require the use of glyphosate-resistant corn hybrids. Using these products on corn

hybrids that are not glyphosate resistant will seriously injure or kill the crop.

[c]Accent Q, Callisto, NorthStar, Steadfast Q, and Stout labels all contain restrictions concerning soil insecticide use. Follow label restrictions carefully or serious crop injury may occur.

[d]Indicates that the addition of Banvel or Clarity may improve control; consult label for details.

[e]Liberty requires the use of glufosinate-resistant corn hybrids. Using this product on corn hybrids that are not glufosinate resistant will seriously injure or kill the corn crop.

Always consult herbicide labels for the proper adjuvants to use. When tank-mixing products, different adjuvants may be required. Consider whether tank-mixes, split applications or follow up applications that are recommended on the label would be preferred to using a single product or timing. Other important considerations are crop variety, soil insecticide interactions, environmental conditions, herbicide volatility or drift to sensitive crops, crop health and stage, crop rotation, and grazing and feeding intervals. This information is available on the herbicide labels.

CONTROL IN SOYBEANS

Satisfactory control of burcucumber in soybeans can be achieved by utilizing a soil-applied program followed by a postemergence herbicide. Control of late-germinating burcucumber seedlings will be required because the seeds will continue to germinate late into the summer. This can be achieved through cultivation, postemergence chemical applications, or a vigorous soybean canopy.

Preplant or Preemergence Control

Herbicides containing chlorimuron will provide suppression of burcucumber when applied as a pre-plant incorporated or soil applied. But soil applications are not adequate for full season control and a postemergence application will be needed.

Postemergence Control

The following herbicides can be used at labeled rates and according to label directions to control emerged burcucumber plants. Subsequent flushes of burcucumber may require multiple or split applications of some products or follow-up applications with other products. See labels for details.

Herbicide	Herbicide Group	Soybean growth stage (maximum size or stage)	Maximum size	Rate/Acre	Efficacy rating[a]
FirstRate	2	before 50% flowering	2-4 leaf or 6 in	0.33 oz	F
Classic	2	60 days before maturity	2-6 in	0.75 oz	G
Synchrony XP[c]	2 + 2	first trifoliate to 60 days before soybean maturity	3 in	0.75 oz	G
Glyphosate products[b]	9	through full flowering	12 in	1 qt	E
Flexstar GT[b]	9 + 14	45 days before harvest	❋	3 to 4.5 pt	E
Liberty[d]	10	70 days before harvest	10 in	29-36 fl oz	G
Engenia, FeXapan, or XtendiMax[e]	4	45 days before harvest (pre-bloom)	4 in	12.8 / 22 fl oz	F

Herbicide	Herbicide Group	Soybean growth stage (maximum size or stage)	Maximum size	Rate/Acre	Efficacy rating[a]
Cobra	14	45 days before harvest or before R6 (full seed)	4 lf	12.5 oz	F-G
Reflex	14	Pre-bloom	❋	1.25 to 1.5 pt	F
Resource	14	60 days before harvest	❋	6 to 12 oz	F
Ultra Blazer	14	not specified on label	❋	1.5 pt	F

❋ Experience in the Mid-Atlantic region indicates activity with this herbicide, although burcucumber is not listed on the label. Application should be made to burcucumber plants less than 2 inches tall.

[a]E = Excellent (>90% control) G-E = Good to Excellent G = Good (80-90% control) F-G = Fair to Good F = Fair (60-80% control)

[b]Products containing glyphosate require the use of glyphosate-resistant soybean varieties. The glyphosate rate given is for a formulation of 4 lb ai (3 lb ae) per gallon. Adjust the rate for other formulations. Using these products on soybean varieties that are not glyphosate resistant will seriously injure or kill the soybean crop.

[c]Synchrony XP (Classic + Harmony premix) requires use of STS soybean varieties. Using this product on non-STS soybean varieties will seriously injure the soybean crop.

[d]Liberty requires the use of glufosinate-resistant soybeans. Two postemergence applications of Liberty can be used; max rate per application is 36 fl oz and total application cannot exceed 65 fl oz.

[e]Engenia, XtendiMax, FeXapan all contain dicamba and must be used only with dicamba-resistant soybeans. Only approved formulations of dicamba are allowed to be applied to dicamba-resistant soybeans. Refer to product label for application requirement, restrictions, and precautions, including allowed tankmix partners.

_____

If annual grasses are present, a product containing glyphosate is the preferred choice. Otherwise, a postemergence grass herbicide should be included.

Always consult herbicide labels for the proper adjuvants to use. When tank-mixing products, different adjuvants may be required. Consider whether tank-mixes, split applications or follow-up applications that are recommended on the label would be preferred to using a single product or timing. Other important considerations are crop variety, environmental conditions, crop health and stage, and crop rotation.

Post-Directed Application

If a serious regrowth of burcucumber occurs before soybeans canopy, and cultivation is not practical, a post-directed application of 2,4-DB at 1 pt/A may be beneficial. This strategy is not as effective as other strategies and should be used only when necessary. Burcucumber cannot be more than one-third the height of the soybeans to allow for spray coverage over the burcucumber. Do not spray higher than the bottom one-third of the soybean plants to avoid crop injury.

Rescue Treatment

Cobra is labeled for suppression of large (up to 36 inch tall) burcucumber plants. Apply Cobra at 12.5 oz/A with 0.5% v/v crop oil concentrate. Because of crop injury from Cobra, this is considered a last alternative for burcucumber control.

CONTROL IN GRAIN SORGHUM

Good burcucumber control can be achieved in grain sorghum. Control programs may consist of soil-applied atrazine followed by a postemergence herbicide program. Atrazine rate restrictions must be considered when planning herbicide programs that include atrazine and/or atrazine premixes.

Preplant or Preemergence Control

Apply atrazine preplant incorporated or preemergence at labeled rates for the soil type. A follow-up with a postemergence herbicide may be needed to control escaped plants. Hand pulling may be equally effective when there are few uncontrolled plants. Follow all herbicide label precautions.

Atrazine provides reasonable control, but because of burcucumber's very aggressive vining habit, one plant per square yard can seriously interfere with crop harvesting. Prepackage mixtures containing atrazine such as Bicep II Magnum, Bullet, or Guardsman Max are readily available for soil-applied use. Spiking pre-mixes with additional atrazine may be needed in order to achieve a total soil-applied atrazine rate of 1.5 lbs ai/A. Sorghum seed must be protected with seed treatments of Concep or Screen when using Dual or premix products with metolachlor. Marksman is a postemergence premix containing atrazine. Be certain to follow atrazine maximum use rate restrictions per application and per season.

Postemergence Control

Control of emerged burcucumber plants can be obtained with Marksman (2 pt/A), Atrazine (2.4 pt/A), Huskie (12.8-16 oz/A) plus atrazine (1-2 pt/A), Maestro 2E (1.5 pt/A), or Clarity (0.5 pt/A). Subsequent flushes of burcucumber may require multiple or split applications of some products or follow-up applications with other products. Consult the labels (or corn section of this sheet) for burcucumber sizes that can be treated with these products.

Always consult herbicide labels for the proper adjuvants to use. When tank-mixing products, different adjuvants may be required. Other important considerations are seed treatment, environmental conditions, herbicide volatility or drift to sensitive crops, crop health and stage, crop rotation, and grazing and feeding intervals. This information is available on herbicide labels.

CONTROL IN VEGETABLES

Chemical Control

There are limited herbicide options for burcucumber control in most vegetable crops. Sweet corn fields can be treated with Bicep II Magnum and postemergence applications of atrazine. Callisto preemergence or postemergence, or 2,4-D, Impact, or Laudis postemergence are other options, although some sweet corn varieties can show significant injury to these products. Sandea is an option for use with some vegetables; check the label for timing and rates. Basagran is labeled for snap and lima beans and can suppress small burcucumber plants, but plants often regrow. Vegetables should not be planted in fields with burcucumber infestations.

Cultivation

Cultivation in combination with herbicide application can increase the overall level of control. When cultivating, care must be taken to avoid bringing soil not treated with an herbicide near the soil surface, thereby reducing the opportunity for seeds to germinate and seedlings to emerge.

SPOT-SPRAY CONTROL (Crop and Non-crop)

Spot treatment can be made in corn, soybeans, wheat, barley, oats, sorghum, forage, pasture, and non-crop areas. For small or localized areas, use the chart below and apply the recommended concentration on a spray-to-wet basis (1 gal/1000 ft^2) to provide thorough coverage. For larger areas, refer to the herbicide label for rates to apply on a per-acre basis. Mowing may be an appropriate alternative to chemical control, particularly in pastures and non-crop areas. Mowing should take place before the plants produce seed.

Amount of herbicide to mix with various volumes of water

Gallons of water	Glyphosate[a]
100	2 gal
25	2 qt
1	2.6 oz (5 Tbsp)

[a]Add a surfactant as required by the label. Amount is based on a 4 lb/gal formulation of glyphosate.

NOTE: Glyphosate will kill non-glyphosate resistant crops in the treated area. Take care to avoid drift outside the target area. Glyphosate does not provide residual weed control; therefore, burcucumber seedlings that emerge after application will continue to grow.

Authors: WF-4

Mark VanGessel
Extension Specialist/Professor
Weed Science and Crop Management
Department of Plant and Soil Sciences
University of Delaware

Quintin Johnson
Research Associate III
Weed Science and Crop Management
Department of Plant and Soil Science
University of Delaware

Revised Feb. 2019