

## Identifying and Controlling Burd cucumber

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According to several surveys conducted over the last 15 years, burd cucumber (*Sicyos anquilatus*) was ranked as one of the 10 most difficult to control weeds in both corn and soybean<sup>1</sup>. For example, when in direct competition with soybean, burd cucumber can reduce yield by up to 48 percent<sup>2</sup>. What makes burd cucumber particularly troublesome is that it often grows aggressively late in the season when many postemergence herbicides can no longer be legally applied. Burd cucumber can grow to cover soybean or corn, interfering with a combine's ability to harvest and resulting in large portions of unharvested fields.

### Description

Native to the United States, burd cucumber is an annual, weedy vine in the same plant family as cucumber. When emerging, burd cucumber's cotyledons are spoon-shaped. Burd cucumber vines can grow up to 10 feet long, and its stems can be either prostrate or climb whatever they contact, including corn and soybean. In some cases, the vine's weight can lodge corn. The stem surface has sticky hairs, making it uncomfortable to the touch — an added bonus, when digging it out of your combine header. Forked tendrils, similar to a pea plant, can wrap around whatever burd cucumber climbs. Its leaves are alternate with three- to five-pointed lobes (1-8 inches long, 1.5-8 inches wide). Flowers are white to pale yellow with separate male and female flowers (monoecious). The fruit are arranged in small bunches and are covered with prickly bristles or spines — adding to the pleasure of its handling. Each fruit contains one seed.



*Burd cucumber, Purdue University*

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### Ecology

Typically, burd cucumber is found in low-lying areas near creeks and rivers, although it can be found on upland sites as well. Smeda and Weller (2001) looked at burd cucumber's emergence, growth rate, seed yield, and seed viability in a field near Lafayette, Indiana<sup>3</sup>. The majority of emergence occurred early in the season, between May and June. Emergence patterns were dependent on rain, often increasing after rainfall events. In one year, Smeda and Weller observed emergence of up to 60 burd cucumber seedlings in a 32-square-foot area after a rainfall event<sup>3</sup>.

Burd cucumber emerging in June can accumulate up to 92 pounds of fresh weight, a substantial load to hang on a corn or soybean plant<sup>3</sup>. Smeda and Weller reported that June-emerging plants could produce an average of more than 42,000 seeds per plant. When plants emerged in August, seed production was reduced; however, these burd cucumber were still able to produce more than 250 seeds per plant. Seed harvested from plants that emerged in August did not germinate, having been scarified and soaked for two weeks to germinate the burd cucumber. Because rainfall is unpredictable and burd cucumber has an extended germination pattern, controlling the weed can be inconsistent.

### Cultural Control

In one study, spring chisel plowing followed by disking increased early season burd cucumber germination, while the effects of decreasing soybean row spacing were inconsistent<sup>2</sup>. In one year, Esbenshade et al. (2001) decreased row spacing from 30 to 15 inches, which resulted in a 44 percent drop in burd cucumber dry weight; however this drop occurred in only one year of the two-year study<sup>2</sup>.

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## Herbicide Control in Corn

Traditionally, burcucumber was controlled by applying high rates of atrazine. At present we recommend the use of a soil residual product such as Balance Pro<sup>®</sup>, Epic<sup>®</sup>, Callisto<sup>®</sup>, Lumax<sup>®</sup>, or Lexar<sup>®</sup> followed by a late application of a POST product. For late POST treatments, drop nozzles with high-clearance sprayers often have to be used. Applying a product with some residual activity (such as Exceed<sup>®</sup>, atrazine, Spirit<sup>®</sup>, or Callisto<sup>®</sup>) is preferred.

## Herbicide Control in Soybean

In soybean, Classic<sup>®</sup> late POST or in a split application, or Synchrony STS<sup>®</sup> can be effective in controlling burcucumber. Glyphosate can control small burcucumber, but will not provide any residual control.

## Burcucumber Studies

Studies in corn and soybean were conducted during the 2004 growing season on a field near Wanatah, Indiana, to investigate PRE plus POST combinations to control burcucumber (see Table 1). PRE applications were made June 7 and POST applications made June 28 (POST applications were made at V2 soybean and V4-V5 corn stages). In the POST applications, burcucumber plants ranged from 0 to 6 inches long in the soybean study and from 1 to 10 inches long in the corn study.

In the corn study, PRE applications alone did not provide acceptable control as of August 19. Using Spirit<sup>®</sup>, Northstar<sup>®</sup>, or Callisto<sup>®</sup> with appropriate adjuvants provided an average of 93 percent, 92 percent, and 90 percent control, respectively, averaged over several PRE application herbicides. Balance Pro<sup>®</sup> (PRE) followed by Liberty<sup>®</sup> plus Callisto<sup>®</sup> provided 93 percent control.

In the soybean study, Roundup Weathermax<sup>®</sup> provided effective burcucumber control; however, glyphosate does not have any residual activity and does not control later flushes. A split application of Roundup Weathermax<sup>®</sup> would be more effective as would adding Classic<sup>®</sup> to a POST glyphosate treatment. Several glyphosate labels allow applications until 50 percent of the soybean plants have bloomed. These late applications may be necessary for effective control with glyphosate.

## Conclusions

Burcucumber is called a “flush weed” because new plants emerge throughout the growing season after rainfall events. These characteristics create management challenges and require growers to scout frequently to monitor new flushes and make timely applications of POST herbicides with residual activity.

<sup>1</sup>Childs, D.J., T.N. Jordan, and R.L. Blackwell. 1996. Survey of problem weeds in Indiana: 1996. Purdue University Cooperative Extension Service. WS-10.

<sup>2</sup>Esbenshade, W.R., Curran, G.W. Roth, N.L. Hartwig, and M.D. Orxolek. 2001. Effect of tillage, row spacing, and herbicide on the emergence and control of burcucumber (*Sicyos angulatus*) in soybean (*Glycine Max*). *Weed Technology* 15:229-235.

<sup>3</sup>Smeda, R.J and S.C. Weller. 2001. Biology and control of burcucumber. *Weed Science*, 49:99-105.

Information listed here is based on research and outreach Extension programming at Purdue University and elsewhere. The use of trade names is for clarity to readers of this publication and does not imply endorsement of a particular brand nor does exclusion imply non-approval. Always consult herbicide labels for the most current and up-to-date precautions and restrictions. Copies, reproductions, or transcriptions of this document or its information must bear the statement “Produced and prepared by Purdue University Extension Weed Science” unless approval is given by the author.

**Table 1. Treatments that provided 90% or greater control burcucumber control 70 days after planting\***

In Corn	Rates/A
Dual II Magnum <sup>®</sup> PRE fb Spirit <sup>®</sup> or Northstar <sup>®</sup> POST	Dual II Magnum <sup>®</sup> (2 pt)
Dual II Magnum <sup>®</sup> + Balance Pro <sup>®</sup> PRE fb Spirit <sup>®</sup> or Northstar <sup>®</sup> POST	Balance Pro <sup>®</sup> (3 oz) Callisto <sup>®</sup> (3 oz)
Lumax PRE fb Spirit <sup>®</sup> or Callisto <sup>®</sup> or Liberty <sup>®</sup> + Callisto <sup>®</sup> POST	Classic <sup>®</sup> (0.5 oz)
In Soybean	
Dual II Magnum <sup>®</sup> PRE fb Classic <sup>®</sup> + Roundup Weathermax <sup>®</sup> or Flexstar <sup>®</sup> + Roundup Weathermax <sup>®</sup> POST	Flexstar <sup>®</sup> (1.3 pt) Liberty <sup>®</sup> (32 fl oz) Roundup Weathermax <sup>®</sup>
Sencor <sup>®</sup> PRE fb Roundup Weathermax <sup>®</sup> POST	(22 fl oz)
Pursuit <sup>®</sup> PRE fb Roundup Weathermax <sup>®</sup> POST	Pursuit <sup>®</sup> (4 oz) Sencor <sup>®</sup> (1 lb)

\*All treatments were applied with appropriate adjuvants.