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Benghal Dayflower/Tropical Spiderwort (*Commelina benghalensis* L.) Identification and Control[1]

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Introduction

Benghal dayflower (also known as tropical spiderwort) is an annual/perennial weed that has become increasingly common in agronomic production systems. Tropical spiderwort was first observed in the early 1990s by both university researchers and crop producers but was initially found only in limited areas. The USDA has noted the appearance of tropical spiderwort in 12 Florida counties. However, this number is likely to be far greater (USDA-APHIS 2012).

Tropical spiderwort is an aggressive weed that produces aerial (aboveground) and subterranean (belowground) flowers. This results in the production of viable seed both above and below ground. Tropical spiderwort also possesses the ability to root at the nodes. New plants can develop from cut stems. Therefore, light cultivation can often break plant parts and increase the area of infestation.

Although tropical spiderwort is difficult to control, early identification and proactive management can greatly reduce its impact on crop yields.

Figure 1. Field infested with solid mat of tropical spiderwort (*Commelina benghalensis*).
Credits: Pratap Devkota, UF/IFAS

Identification

Tropical spiderwort has often been confused with spreading dayflower (*Commelina diffusa*) and Asiatic dayflower (*C. communis*). However, four characteristics separate tropical spiderwort from the other dayflowers:

1. *Leaf size*—The leaf blade of tropical spiderwort is wider and shorter than that of other dayflower species.

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2. *Presence of leaf hairs*—Dayflower species possess a thick, waxy leaf that lacks hairs (glabrous). Tropical spiderwort, on the other hand, often produces hairs on the young leaves and petioles.

3. *Flower color*—The flowers of many dayflower species are blue in color, while tropical spiderwort is more purple/lavender.

4. *Root structure*—Unlike all other dayflower species, tropical spiderwort produces underground flowers. Examining the roots allows easy detection of these flowers. These flowers will appear as swollen nodes.

Figure 2. Common or Asiatic dayflower (*Commelina communis*).
Credits: Virginia Tech Weed Identification Guide

Control

The reason for tropical spiderwort's sudden emergence as a problem weed is currently unknown. However, some of our current crop production practices seem to favor its growth. It has been observed that minimum-tillage production systems encourage greater germination and growth of this weed. High tolerance to glyphosate has also been documented. Therefore, strip-till production and use of glyphosate will lead to an ideal environment for tropical spiderwort growth after glyphosate eliminates competition from other weeds. Another observation is that tropical spiderwort germinates later in the summer but grows poorly in low-light environments. Using earlier planting dates to form a dense crop canopy prior to germination can suppress tropical spiderwort growth and establishment.

Although tillage, rapidly growing crop varieties, and earlier planting dates improve tropical spiderwort control, the use of herbicides is still necessary. Below are the most current and effective herbicide management options that have been developed for control in cotton and peanuts.

Figure 3. Tropical spiderwort (*Commelina benghalensis* L.). Note the leaf hairs and purple/lavender flower.
Credits: Pratap Devkota, UF/IFAS

Figure 4. Tropical spiderwort roots showing swollen nodes or subterranean flowers.
Credits: Stanley Culpepper, University of Georgia

Cotton

Tolerance to Roundup (or other glyphosate-containing products) presents a challenge to tropical spiderwort control. Although Roundup can control tropical spiderwort when applied to small (1- to 2-in tall) weeds, the lack of soil residual activity will often result in approximately 50% control by late season. Therefore, other herbicides must be included to improve control and provide soil residual activity. The addition of Staple (pyrithiobac sodium) or Dual Magnum (*S*-metolachlor) has been shown to improve tropical spiderwort control over glyphosate alone applied at early postemergence. However, adding 1.33 pt/A of Dual Magnum to glyphosate is currently the best control option.

Roundup (glyphosate) + Dual Magnum will often provide near 80% control. However, Dual Magnum will only control plants that have not yet emerged, so applications must be made early in the growing season to be effective. It must also be noted that Dual Magnum will commonly cause leaf burn when applied to small cotton, but recovery will often occur within 7 days of application. Additionally, Dual Magnum *cannot* be applied prior to cotton emergence, or severe cotton injury will result.

Post-directed applications may also be necessary if large populations of tropical spiderwort exist. The key to controlling emerged plants is early applications to small weeds. Mid-season applications of Roundup + Valor (flumioxazin) or MSMA + Valor will provide the most effective control, but cotton must be 16 in high before using Valor. Delaying applications until later in the season (treating larger plants) will reduce the herbicide applications' effectiveness.

Dual Magnum will be the foundation for tropical spiderwort control programs. However, Dual Magnum applied early postemergence will generally not be sufficient for season-long control. Therefore, 1 to 2 post-directed applications targeting small plants will generally be most effective to control escaped plants.

Peanuts

Controlling tropical spiderwort in peanuts will require multistep management practices that include both cultural and herbicidal means. Implementing twin-row planting is one cultural practice that has been shown to improve tropical spiderwort control by 8% when averaged over several herbicide combinations. This is due to more rapid cover of the soil surface with twin rows rather than peanuts planted in single rows. The coverage will shade the soil surface and interfere with weed seed germination and emergence.

A successful herbicide program, as in cotton, will likely require an early-season application of Dual Magnum. Preemergence applications of Dual Magnum are not as effective. However, data collected in Florida have shown that Gramoxone Inteon (paraquat) at 8 oz/A + Dual Magnum at 1.33 pt/A will provide approximately 90% control when applied at cracking. Gramoxone Inteon + Dual Magnum may be applied up to 28 days after cracking, but early applications (7 to 14 days after cracking) will generally provide better weed control and reduce peanut injury (Stephenson IV and Brecke 2011). Strongarm (diclosulam) herbicide has also been effective at controlling or suppressing tropical spiderwort growth.

Mid- or late-season herbicide applications for tropical spiderwort control have been inconsistent, and herbicide efficacy is often related to the weed size. Cadre (imazapic) or Classic® (chlorimuron) + 2,4-DB can provide some control if applied when tropical spiderwort is small. However, these herbicides should be used as part of a control program that contains Gramoxone + Dual Magnum.

Conclusion

Tropical spiderwort is a highly competitive and difficult-to-control weed that is relatively new to crop producers in Florida. However, effective control can often be attained if early scouting, cultural, and herbicidal management practices are implemented. Deep tillage may be helpful in extreme conditions, but this should be used only if herbicidal and cultural management programs have proved ineffective.

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