Weed of Interest: Horsenettle (*Solanum carolinense*)

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Horsenettle is native to the Southeastern U.S. and has become naturalized in much of the eastern half and parts of western North America. It is a weedy species that infests a variety of agricultural commodities including pastures and row crops such as strawberries and cane fruits, where it is mostly encountered on Long Island. Horsenettle, also called tread-softly, bull-nettle, and sand briar comes equipped with several weapons that make it one of the most formidable weeds native to North America.

Horsenettle is an herbaceous perennial closely related to the potato. The aboveground growth is comprised of groups of single shoots growing not usually taller than 12-18 inches. The stems and underside of the leaves are lined with slender yellow spines. It is these spines that give rise to the nickname tread-softly. The shoots emerge in late May and June and will continue throughout the summer. Aside from the spiny growth, one of horsenettle's 'weediest' qualities is its extensive and deep creeping root system. The roots will grow both laterally and vertically; some growing as deep as the frost line (3 feet) in a season. The creeping roots (not rhizomes) will give rise to new shoots as they grow along in the soil. If the roots are disturbed and cut up with cultivation, new shoots will start to arise from pieces as small as 0.5 inch. In addition to the roots, the plants also produce seeds which are borne in small, yellow fruit in September. A single plant can produce as many as 5,000 seeds in a single season. The fruit is distinctive and attractive to both wildlife and domestic animals. However, both the leaves and fruit are highly toxic: containing sometimes lethal levels of the alkaloid solanine. Livestock, especially cattle, are susceptible if the ripe fruit are ingested. However, studies have shown that while birds and other wildlife may not prefer to eat horsenettle berries if given a choice, they can consume them without harm and the seeds will pass through intact within 24 hours.

Horsenettle flowers in late August. Photo by A.Senesac

Other studies have shown that allelopathic chemicals are released from horsenettle foliage which prevents germination of many types of seeds, including its own. This is seen as a mechanism to prevent seedlings from using resources that the parent plant needs to thrive. Being so closely related to several important vegetable crops like potato, tomato, eggplant and pepper, it is not surprising that horsenettle acts as host for many economically important diseases and insect pests of those crops, including early blight, Verticillium wilt and tobacco mosaic virus. It is interesting that the many qualities that allow horsenettle to become a successful 'pioneer-

A pasture infested with horsenettle. Photo by A. Senesac

ing' species within its native range also equip it to be just as successful as a weedy species when growing among the plants that humans value and grow. Qualities such as self-armor (spines), anti-predation (toxicity), and complex reproduction strategies (numerous seed and creeping roots) allow it to move into new territory, whether it is in natural areas or agricultural, with relative ease.

Management strategies: A major reason that horsenettle is not a major pest of intensively cultivated row crops like potatoes and other vegetable crops is that it will not tolerate multiple soil disturbances in a season. Cultivation in the form of plowing, disking and row cultivation will break up the roots into small pieces. While a single occurrence will only serve to propagate the plants, multiple, rigorous disking over the course of a season will force the root pieces to disintegrate without allowing them time to regenerate. Once an infested piece of land is cleared, short-season vegetable crops can then be grown. Undoubtedly, small plants will appear in these crops and it is important to remove them before they can re-establish. Although difficult to eradicate, horsenettle has been managed using this strategy over years. One strategy that will not work is to tarp or mulch an infested area. Back in the early twentieth century, author Ada Georgia quoted an Indiana farmer as saying that "horsenettle can live ten years under a heap of sawdust and grow as soon as the dust is removed." ●