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Survivability of Tropical Soda Apple Seed in the Gastro-Intestinal Tract of Cattle

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Recent estimates indicate that tropical soda apple (TSA) has spread to 400,000 acres in Florida, and that it is present in nearly 30 percent of Florida's bahiagrass pastures. The weed has been identified in most counties in Florida, and has been observed in Alabama, Georgia, Mississippi, and South Carolina. Livestock producers have observed TSA seedlings germinating from dung piles, indicating that the seed can survive passage through the digestive tract of cattle and wildlife. This has implications for the movement of cattle, not only from one pasture to another on a given ranch, but from one area to another.

A study was conducted to determine rate of passage and survivability of TSA seed in the digestive tract of cattle. Steers were fed stargrass hay and dosed with 40,000 TSA seed. Fecal samples were obtained at 12, 24, 36, and 48 hours after dosing, and then every 24 hours for a total of 18 days. TSA seeds were washed from each sample, counted and subjected to germination tests. Flow of TSA seed through the cattle's digestive tract followed a typical passage rate pattern (Figure 1). A small quantity of seed was found in the feces 12 hours after dosing. Most of the seed dosed (greater than 90 percent) had passed through the digestive tract by 48 hours post-dosing. As sampling time increased beyond three days, seed passage in individual animals was variable. For example, in given animals, seed may be found in the feces for four consecutive days, but would not appear for two or three days, and then appear for several days. This indicates that TSA seed can be trapped in various locations in the digestive tract, and may remain for an extended period. Germination of seed collected from the feces 24 hours post-dosing averaged 90 percent. As sampling time increased to six days, seed germination declined to 0.0 percent. After six days in the digestive tract, the TSA seed was not viable. Even though TSA seed may remain in the digestive tract for extended periods, the seed becomes non-viable after it remains in the digestive tract for approximately six days after consumption. This suggests that before cattle are moved from an area containing TSA,

they should be held in an area that is TSA-free for at least one week before being moved to a new area.

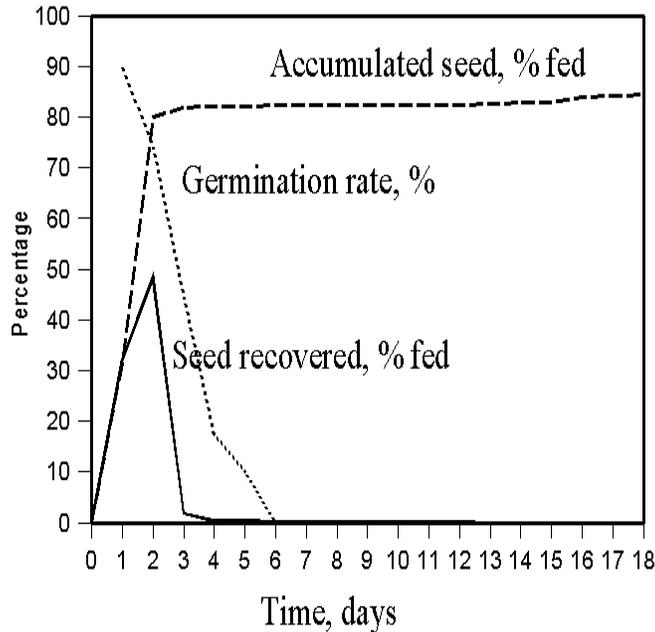


Figure 1. Passage and germination of tropical soda apple seed through the gastro-intestinal tract of cattle.

In another study, cattle fecal samples were collected bi-monthly from a TSA-invaded bahiagrass pasture and a TSA-infested oak hammock on a commercial ranch in Hendry County, to evaluate TSA seed levels in cattle feces under practical grazing conditions. The viability of TSA seed collected from both sites ranged from 80 to 88 Percent (Figure 2), indicating that a majority of the seed had passed through the digestive tract within three days after

consumption. Greatest number of seed occurred during the summer months with lower seed numbers in the winter months, although part of the reduction in seed numbers between October and December was due to initiation of a TSA control program. Based on a daily fecal production per cow of 10 to 12 lbs. DM, and a stocking rate of one cow per two acres, a mature cow would excrete approximately 1 ton of dry feces per acre per year. Using these assumptions, the number of viable seed from the bahiagrass pasture and oak hammock ranged from 15,000 to 64,000 per ton of dry feces, or 56,000 seed per acre. This would be more than enough seed to result in 100 percent ground cover. Cattle grazing TSA infested areas should be considered a major seed dispersal vector. Controlling the movement of cattle will help prevent the spread of TSA.

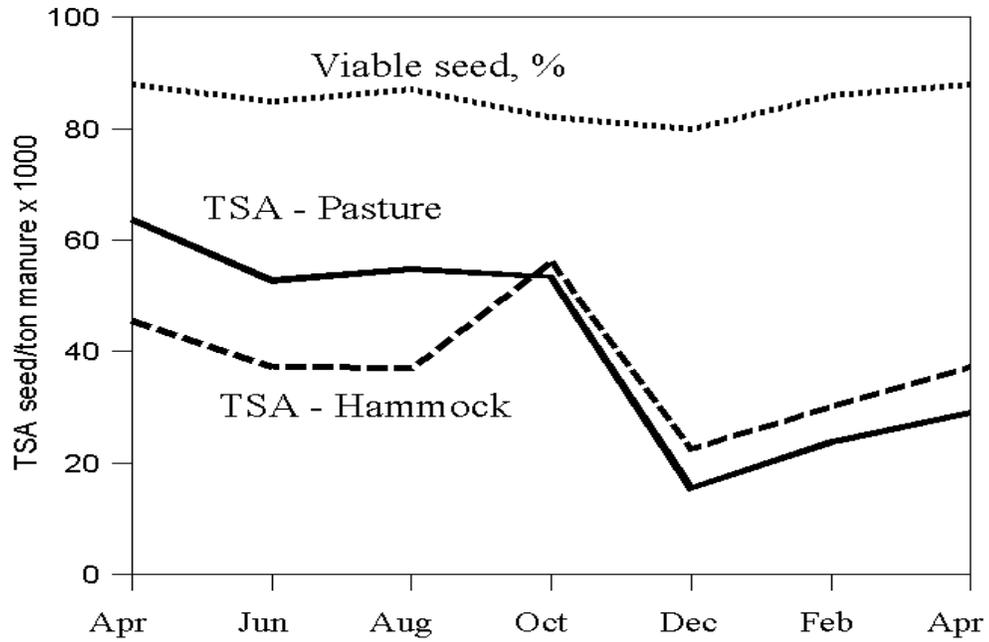


Figure 2. Presence and viability of tropical soda apple seed in cattle feces from pasture and hamock areas on a commercial ranch