A Pest in Paradise: Two-Line Spittle Bug Attacks Hawaii Rangelands

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Valued at more than $68 million annually, livestock ranching is a highly productive and extremely important industry on all major islands in the State of Hawaii. Now however, the Hawaiian livestock industry faces severe threats from exotic pests such as the newly discovered two-lined spittlebug (TLSB), *Prosopia bicincta*. It is not known when the TLSB was introduced into Hawaii however, they were first detected in the Kailua-Kona area on Hawai`i Island in September of 2016 where it had caused severe damage to nearly 2,000 acres of rangeland. The pest has since rapidly expanding its range and is now causing similar damage to an estimated 150,000 acres. In highly infested areas there has been nearly 100% die back of the dominant and key range grasses. The loss of these grasses provides entry for the establishment of many undesirable and invasive plants. Currently TLSB appears to be isolated to the North and South Kona areas, but because of its seeming preference for key livestock forage grasses it has the potential to spread throughout the islands and irreparably harm large areas of valuable livestock grazing lands. There are currently no integrated pest management (IPM) protocols, nor are there any known natural enemies of TLSB present in Hawaii. Additionally, the potential geographic spread of the infestation is currently unknown but is potentially extensive, and very little is understood about how this new pest will perform in the Hawaiian environment. Consequently, TLSB is poised to become a major economic threat to the pasture-based livestock industry in Hawaii unless steps are taken to control the pest.

The two-lined spittlebug is native to the southeastern United States where it is a major pest of warm-season grasses. Adults resemble leafhoppers with two red stripes traversing the forewings held over the back of the body. The nymphs reside in “spittle masses” that protects them from desiccation and predators. The masses are found at the base of grasses near the soil line (Figure 1). Both nymphs and adults feed on the grass using a needle-like mouth part to penetrate the dermis and suck out the plant fluids. The adults may also inject the plants with *amylase*, an enzyme that breaks down starches. This feeding leads to weakened and stressed grasses that turn yellow as leaf material dies. Severe infestations can kill the grass outright with very little recovery (Figure 2).

To combat this pest a taskforce comprised of extension specialists and agents, graduate students and research technicians from the University of Hawaii and personnel from the Hawaii Dept. of Agriculture (HDOA) Plant Pest Control Branch was formed in the fall of 2017. Funding is provided by the HDOA. The goal of the taskforce is to restrict the further spread of TLSB and to prohibit its establishment on the other non-infested Hawaiian Islands through rancher outreach and education; detection and surveillance; development of Integrated Pest Management (IPM) protocols; biological control agent exploration; and research into the biology and ecology of TLSB in Hawaii.

Figure 1. Two-line Spittle Bug adult (top) and nymphs in spittle mass found along grass roots just below the soil surface. Both the adult and nymph feed on the xylem (nymphs) and phloem (Adults) of the plant. Adults inject amylase into the plant that interferes with photosynthesis resulting in leaf die-back and in severe cases, plant death.

Figure 2. Progression of a TLSB infestation from initial attack (left, June 2018) on healthy range grasses involving a small patch to all visible range infested (right, January 2019) with dieback of grasses and increasing weed infestation. Applications of pesticides and intensive grazing in the early stage of an infestation may reduce the degree of TLSB damage observed on the right.