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Tiny Pest, Tremendous Problem

INTRODUCTION

Imagine this: Green, healthy pastures. Peaceful, rolling hills on the slopes of Mauna Kea, the tallest mountain on the Big Island of Hawaii. Abundant forage for cattle. A thriving Hawaiian rangeland. However, within months, the grass starts to die off abnormally. Large patches wilt and dwindle. Thick, encroaching, invasive weeds engulf the range ecosystem. Blackberry and other noxious weeds overtake the once beautiful kikuyu pastures.

Many people equate Hawaii with paradise. Beautiful beaches, calm tradewinds, and lush vegetation. However, this warm, tropical utopia for residents and tourists has quickly transformed into a haven for invasive species. With the ideal climate and little to no natural predators, a tiny pest has become a tremendous problem. The two-lined spittlebug (TLSB) is one of the most devastating invasive species in Hawaii and is inflicting detrimental damage on our state's rangelands.

BACKGROUND ON THE INSECT

Also known as *Prosapia bicincta*, the TLSB is native to southeastern North America, likely arriving on the west side of the Big Island through plant transportation. It was first discovered in September 2016 in Kona, HI. Since then, the tiny insect, smaller than a pinky finger nail, has been attacking kikuyu and pangola grasses, two important forage species to the cattle industry that provides ground cover to reduce erosion. According to the Big Island

Invasive Species Committee (BIISC), these two particular forages "support nearly 70% of Hawaii's beef cattle industry."

The TLSB is a member of the *Cercopidae* family within the order *Hemiptera.* The TLSB damages these forages by feeding on them in various stages of its life cycle. The TLSB undergoes an incomplete metamorphosis, meaning it has three general stages of growth: egg, nymph, and adult. When the nymphs hatch from the egg, they attach to the plant and begin feeding. During the nymphal stage, the bugs are tiny and have red eyes, a brownish head, and a yellow abdomen. As the young nymphs hatch from their eggs, they go through five nymphal stages, or instars, growing and molting until they reach the adult stage. Throughout most of its nymphal stages, the TLSB emits a frothy, white, bubbly substance, called the spittle mass, the bug is kept moist and protected as it matures. The TLSB spittle mass is usually found at the soil level, making it extremely hard to find and treat the pest. The adults are ⅜ inch long, have red eyes, a red abdomen, and black wings with two orange stripes (lines) along their back.

PROBLEM / IMPACT

The TLSB attacks kikuyu and pangola grass, high-quality forages in Hawaii that are vulnerable to damage. As a sap-sucking insect, the TLSB feeds on plant nutrients through its needle-like mouthpart. Furthermore, according to TLSB Hawaii, "The TLSB saliva contains amylase, an enzyme that breaks down complex carbohydrates into simple sugars, which interferes with photosynthesis and carbohydrate translocation." In other words, the saliva acts like a toxin, interfering with the plant's ability to make its own food, thus leading to discoloration, wilting, and death. This causes the entire grass plant to die, from the root to the

blade, often appearing in large patches. Alex Beaton from the Natural Resources Conservation Service (NRCS) stated, “What really struck me was the fact that you could swipe your hand over the forage and it would be dead to the root.” Within 24 hours of adult feeding, damage may be visible (TLSB Hawaii). “The leaf blade dies 1-3 days after feeding, and the tiller dies 3-4 days after feeding. Damage appears as yellow streaks or tips, followed by browning and curling” (TLSB Hawaii).

To make matters worse, after the desirable grasses die, empty patches are vulnerable to invasive weeds. Explained by Mark Thorne, Range & Livestock Management specialist at University of Hawaii “The first one [weed] that typically comes in is fireweed. It can be extremely aggressive. We’ve seen at the end of the second year less than 2% kikuyu cover and 98% fireweed cover.” In the following years, other invasive weeds such as the balloon plant, marestail, blackberry, Himalayan raspberry, and pamakani widely cover the rangelands, limiting any other land uses.

Moreover, ranchers are losing production capacity due to the lack of grass. As a result, they must reduce their herd, which reduces their income and weakens regional agricultural economy and food security. Meanwhile, the efforts to combat the TLSB are very costly, on top of controlling the aggressive weeds. Kaua Wall, from Wall Ranch in Kona, expresses, “We’ve cut back our herd 50% due to the spittle bug, and we’re still decreasing our herd. We won’t get back to 100% for about 10 more years.” This is the harsh reality that many ranchers face as this tiny pest destroys their pastures.

The TLSB goes deeper than destroying pasture health; it's threatening Hawaii's food security, landscape, and paniolo (cowboy) culture. Bringing in over $68 million annually, the cattle production is Hawaii's "largest producer of protein in the Islands" (TLSB Hawaii). Sheep and other wildlife rely on grass pastures that the TLSB is infesting and destroying. Our beautiful Hawaiian landscapes are being overtaken by thorny, invasive weeds. Outdoor activities such as hiking, hunting/wildlife observation, and sightseeing are all at risk as thick, impenetrable weeds grow, covering once open, thriving fields and trails. Hawaii's culture and community are deeply rooted in ranching. If the industry struggles and jobs are lost, so is the rich heritage and livelihood of paniolo. Rangelands require support from a variety of occupations, including veterinarians, mechanics, engineers, welders, and human resource agencies. The ripple effect of the TLSB will impact our communities, not just rangelands. Kaua Wall shares, "I see places [rangelands] that my grandpa and great grandpa worked so hard in creating…and then to see it all go in a matter of years is so hard." Additionally, during COVID-19, numerous meat processing plants around the nation shut down. Local farmers and ranchers sprang into action, providing fresh food for the island despite facing hardship. A quote from TLSB Hawaii expresses, "This kind of resilience is only possible with a healthy, strong community food network made up of successful farmers and ranchers." This demonstrates the importance of ranchers as both land stewards and food producers for the community.

CHALLENGES

One reason the TLSB causes more damage in Hawaii is that the insect's attraction to warm, moist climates, where it thrives. Careful study reveals that their season begins around April and May, their numbers peaking in the summer months, and **ends** around October (TLSB

Hawaii). As the conditions become colder and drier, the insect enters diapause, a season of dormancy where activity slows down and a small number of nymphs or adults are present. Unlike most states on the mainland, Hawaii doesn't have temperatures low enough to freeze and kill off the TLSB eggs. Furthermore, Hawaii doesn't have natural predators, such as the red imported fire ant, *Solenopsis invicta*, or tiger beetles, *Megacephala carolina* (Department of Entomology, University of Georgia).

Unfortunately, the lack of natural die-off in the winter equates to nymph outbreaks exponentially greater than the last. For example, a pasture with 35 nymphs per square meter could increase anywhere from 60 to 200 nymphs per square meter in the second generation (Mark Thorne). Anything over 50-60 nymphs per square meter will start to kill the grass. Mark Thorne reports, "Anything under 50 nymphs per square meter will suppress, but not kill the grass. When the 50-60 threshold is met, the population becomes critical, and we see a rapid, catastrophic die off."

The sooner we target the pest, the more effective our treatments will be. Due to the size and vast number of bugs, they easily spread. Adults are often found flying around, being able to flee threats and rapidly spread out. Therefore, we must identify and treat the TLSB while the population is small (in new places). In 2016, only 2,000 acres of the Big Island were affected. Sadly, in 2021, over 176,000 acres had been impacted.

SOLUTION

What is the solution? We must identify the infested areas to take action while the population is still small by checking the turf at the soil level for spittle mass. Possible solutions that ranchers have tried include seeding pastures, spraying insecticides, and controlled burns. First, seeding pastures with TLSB-resistant grasses will combat the spread. Unfortunately, the seed and process of seeding are very expensive, and remote rangelands are very difficult to reach with heavy machinery. Research by the University of Hawaii is an ongoing process, as finding alternative, TLSB-resistant grasses that are good for forage is essential. This will allow pastures damaged by TLSB to be restored and to build more resilient pastures not yet affected by TLSB. Secondly, insecticides can be somewhat effective if applied after infected pastures have been exposed, primarily through mowing or intensive grazing. Again, this is very costly, and the success of the spray depends on the bug's life stage. Lastly, controlled burns can kill off TLSB, reducing the population; however, it’s a risky process.

What can Hawaiian residents do? First and foremost, we must be aware! When traveling between islands or out of infested areas, clean your shoes, gear, and vehicles. Additionally, the TLSB can hide in potted plants or soil, so don’t transport those plants out of infested areas. Lastly, we must spread the word. This is a problem for our entire state, not just ranchers. The more people know about the TLSB, the more they will care about the issue and can contribute to the fight against the TLSB.

The TLSB crisis links back to a root issue, biosecurity. According to the Miriam-Webster dictionary, biosecurity is defined as “security from exposure to harmful biological agents.”

Specifically in Hawaii, efforts are being made to protect agriculture and the environment from invasive species through inspections and stricter laws, however there are still several gaps. If we don't increase Hawaii's biosecurity, then more shipments with pests will come to Hawaii, which requires more money to treat and control the pests. Furthermore, the price of local food will increase because farmers and ranchers will be spending more money on invasive species management. The less local food we have, the more imports we will receive and rely on, and the cycle starts all over again.

Outline

Works Cited

Big Island Invasive Species Committee BIISC. "Twolined Spittlebug: A New Threat to Hawai'i's Agriculture." *YouTube*, 24 June 2021, www.youtube.com/watch?v=m16mfcQM0QQ. Accessed 20 Jan. 2026.

Nachappa, P., Guillebeau, L.P.,Braman, S.K., and All, J.N., Journal of Economic Entomology, 99(5):1711-1716. 2006

Thorne, Mark S., Detection and Control of *Prosapia bicincta* (Two-line Spittlebug) in Hawaii. University of Hawaii Cooperative Extension, 2019

TLSB Hawaii. "TLSB Hawaii." *TLSB Hawaii*, 2019, www.tlsbhawaii.com/. Accessed 20 Jan. 2026.

Tsai, Michael. “Bill Targets Two-Lined Spittlebug Threat.” *Spectrumlocalnews.com*, 2024, spectrumlocalnews.com/hi/hawaii/politics/2024/03/12/bill-targets-two-lined-spittlebug-threat. Accessed 20 Jan. 2026.

“Two-Lined Spittlebug (TLSB).” *Hawaii.gov*, 2023, dlnr.hawaii.gov/hisc/two-lined-spittlebug/.

“Twolined Spittlebug - Big Island Invasive Species Committee (BIISC).” *Big Island Invasive Species Committee (BIISC)*, 9 Sept. 2022, www.biisc.org/pest/tlsb/. Accessed 20 Jan. 2026.

“Biosecurity.” Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/biosecurity. Accessed 1 Feb. 2026.