# New technology pivotal amid fight against invasive weeds

**Kia'i Moku**
By James Leary

Developing modern technologies to defend against invasive weeds

Invasive weed infestations within Maui County are literally a growing problem. Despite the tough economic recession, invasive species prevention and mitigation programs remain a necessity for conserving our natural and agricultural resources. We only need to look back a few months ago to remember the show of local support for our state agricultural inspectors. While some positions were retained, Maui must still deal with the losses of important HDOA positions. Despite these setbacks, our local ranchers and natural area managers remain steadfast to continue the fight against these detrimental weed infestations, simply out of necessity. In support of these efforts, The College of Tropical Agriculture and Human Resources (CTAHR) is providing a new service in research and extension to the county and across the state. Being new to the position, I currently spend much of my time gaining more intimate knowledge of the invasive weed problems across Maui so that we can develop a research and extension program that will provide new technologies for the "boots on the ground" on our island. My current mission is to investigate efficient management strategies that are environmentally sound and cost effective. Below I describe some of the on-going work currently being conducted.

Mowing is a tool that has been utilized for decades, but is often relegated to roadside and residential areas for maintenance and beautification. It rarely has utilities as a dedicated method in weed management. Too many times, we've observed weeds respond to mowing with aggressive regrowth, thus making the situation a perpetual battle. In collaboration between CTAHR and American Machinery Inc., field studies are testing the Wet Blade® technology (Diamond Mowers Inc.), which integrates mechanical mowing with an herbicide wiper application. So far it's proving to be quite useful in eradicating some of the worst weed infestations from our grazing pastures. The Wet Blade® that is currently being used for on-island demonstrations is a six-foot diameter rotary design with swivel-mounted blades made of thick hardened steel coated with a thin herbicide layer on the underside of the blade. As the mower blade is cutting the vegetation the herbicide residue is instantly applied to the freshly cut weeds without any drift or non-target injury. Early results for this technology are proving successful on guava (Psidium guavaja), rauvolfia (Rauvolfia vomitoria), sacramento burr (Triumfetta semitriloba) and the dreaded fireweed (Senecio madagascariensis). Currently, this technology is showing to be most useful in small-scale pasture renovation, conservation site clearing, orchard row maintenance and even fire break establishment.

An important component of all invasive weed management strategies is to efficiently and effectively mitigate the spread of small satellite populations to prevent them from becoming major infestations. Many natural areas in Hawaii consist of extremely steep, densely vegetated, or otherwise inaccessible terrain, thereby requiring a significant amount of time and energy to access each target for eradication. In some cases, rappelling is required to access certain areas, which is dangerous, but necessary work. New technologies are being developed at CTAHR that can accurately deliver discreet herbicide doses from safer long-range distances. The recreational paintball industry has contributed to the technological advancements of liquid encapsulation and pneumatic ballistics. These existing technologies have been adopted for developing a new tool in invasive weed management called Herbicide Ballistic Technology (HBT). Small volumes of herbicide are encapsulated into gelatin projectiles that can be delivered to specific weeds with extreme accuracy using a standard paintball gun. The first prototype batches of HBT capsules were highly effective in trials targeting Australian tree fern (Sphaeropteris cooperi), banana poka (Passiflora mollissima) and kahili ginger (Hedychium gardnerianum) from over 100 feet away. While HBT is still in the stage of experimental development, we have high hopes that this new technology will become available for assisting field crews with safer pesticide handling and an improved application technique that will ultimately provide a more surgical approach to weed control.


Above: A standard recreational paintball gun is shown in East Maui as a resource manager tests the potential of Herbicide Ballistic Technology to control Himalayan ginger. Officials encapsulate small volumes of herbicide in gelatin projectiles to be aimed at specific weeds with extreme accuracy.

Left: A Wet Blade mechanical mower sits in a fire-weed infested Makawao field during a recent demonstration of the technology by James Leary.

To learn more about the technologies being developed for invasive weed management in Hawaii, please visit our "HawaiiRREA" channel at www.youtube.com and for further inquiry please feel free to contact your new extension specialist at leary@hawaii.edu. The use of brand names in this article do not constitute as a sole endorsement of these products, but instead promote the concept of adopting new technologies for safe and effective weed management.

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As submitted to the Maui News. Published February 14th, 2010. Page C6