

A problem of madagascar fireweed species

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Introduction

Invasive species is a living organism that is not native to an environment. They move into the environment mostly by human activities, which are usually accidental. Invasive species have a tendency to spread causing damage to the environment, human economy, and wildlife. In fact they are one of the leading threats to native wildlife second only to degradation. They threaten the wildlife by preying on native species, out competing, spreading diseases, altering ecosystems, or decreasing biodiversity. However that is not the only reason why you should dislike invasive species. “ In the U. S. alone they cost \$137 billion a year to control” (“ Why Should You Care”, 2009). They devastate industries such as seafood, timber, and agriculture and Impede recreation such as hiking, fishing, and gardening(“ Why Should You Care”, 2009). Getting rid of the invasive species is not only beneficial to the government but to you directly and indirectly.

Madagascar Fireweed is one of these invasive species that was introduced into Hawaii by cattle shipments in the 1980's (P. Motooka et al, 2004). It is a low, upright, branch native to Madagascar and South Africa. They bloom small daisy like flowers that spreads quickly and overtakes pastures by outgrowing other plants. Currently it is on the islands of Maui, Big Island, Lanai, and Kauai (“ FIREWEED, AKA MADAGASCAR RAGWORT”, 2013). The main infections of the Madagascar Fireweed are on the Big Island and Maui. On Maui it expands from Makawao to Ulupalakua and on the Big Island it is so widespread that it is no longer controllable. It harms cattle and is hard to get rid of it alone costs Hawaii \$2 million a year (P. Motooka et al, 2004).

Hawaii Department of Agriculture removes the invasive plant by biological, chemical, and cultural methods.

The invasive plant Madagascar Fireweed is a noxious weed problem in Hawaii that needs to be removed quickly as possible. Some people say the solution to the problem would be to maintain cattle in a fenced area and stop spending money since they believe it will never be removed completely. However we need to take action before it grows completely out of control on every island since it is very poisonous to livestock, it easily spreads to other areas greatly reducing land for grazing, and it's very costly to the state and ranchers.

Main Ideas

Livestock such as horses, pigs, poultry, and cattle are especially sensitive to the effects of eating the Madagascar Fireweed. They only need to consume a very small percentage of their body weight of the plant to develop serious complications or death (P. Motooka et al, 2004). Goats and sheep are not as sensitive to the effects of the Madagascar Fireweed, however young or lactating females could be effected (Thorne et al, 2005). Replacing or treating cattle that have consumed the invasive plant is where most of the cost comes from. Madagascar Fireweed has a chemical known as pyrrolizidine alkaloid that poisons the animal. The most susceptible are pigs, poultry, cattle, and horses while the least are sheep's and goats. Horses died consuming the fireweed at 4-8% their body weight while the least effected had to consume 2-3 times their own body weight. Although just 1% a day of a goat or sheep body weight can forcefully abort their baby (Thorne et al, 2005). Humans don't get poisoned from effected livestock milk or meat. The

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poison pyrrolizidine alkaloid are absorbed into the digestive tract of animals and transferred to the liver where it will be converted into toxic pyrroles. These toxic pyrroles end up damaging the liver to the point where animals die or suffer slowly from the loss of liver function. Symptoms include abdominal pain, loss of interest to food, lesions, diarrhea, weakness, and may wander aimlessly (Thorne et al, 2005). Sometimes it's hard to tell if the livestock has been poisoned and could be too late when treatment is applied.

Hawaii has a very sensitive economy that depends on tourism. Another thing that Hawaii economy depend on is farming and livestock. Making sure these resources stay uninfected is vital to Hawaii economy, so eliminating threats is of importance. This especially includes the invasive species known as the Madagascar Fireweed. In a year it costs Hawaii two million dollars to ensure the noxious weed is kept under control along with costs of cattle. A significant drawback is when the ranges and pasture lands are reduced because of risks involved with the plant. Along with reduced livestock, and poor animal condition the situation grows worse. In Maui and Big Island this is really evident as a lot of land is lost or uncontrolled. Because it is too expensive to plot land somewhere else on the island these rancher usually have to run the risk of poisoning their livestock. Unfortunately the fireweed spreads by air with each plant being able to produce up to 30, 000 seeds in its lifetime (Thorne et al, 2005). The seeds can be viable up to a couple of years which makes it harder to get rid of completely unless you burn the land. At the same time Hawaii can't afford to give up controlling the fireweed as it is more expensive to replace the animals.

The invasive plant is very costly to the state but also the people whose livelihood depend on the cattle. Such as the ranchers themselves who must be vigilant at all times when inspecting their field or their livestock. They end up having to pay some of the cost themselves and are the frontier of protecting their livestock. It costs them their time, their money, and their salary when the fireweed shows up on their land. For the state is costs money for the manpower and the treatments of getting rid of the fireweed. Some methods are more costly than others such as having sheep/goat graze on the weed. Some methods do not work at all like mowing and pulling. Prescribed burning requires a lot of planning and needs experienced workers at the site (Thorne et al, 2005). Failing to eradicate the target plant may end up hurting the land more than helping it. Other than the state and ranchers, people who run businesses for horseback riding may suffer costs from fireweed poisoning. As the tourists are not completely educated on what the horses may feed on and what they shouldn't. Overall Hawaii must keep on using two million dollars each year to combat the fireweed spread and cost effective methods to control the invasive species.

Conclusion

The best way to combat the Madagascar Fireweed is prescribed burning or to bring an a predator species. In recent news the Madagascan fireweed moths, *Secusio extensa*, have been released into the wild to fight the invasive plant. However “ It took a year and a half before we saw any evidence of establishment” (Luca et al., 2014). Since they moths have been released recently more time and data is needed to find out if they are beneficial in the long run. There may be already millions of fireweed moths but since the

plant is so widespread Hawaii needs an estimated trillion of them. Two other species of insects may be introduced into Hawaii to fight the fireweed. We can expect the fireweeds to be around for a while but in time they will shortly become reduced.

We the people need to take action as well before it grows out of control since it is very poisonous to livestock like cattle, it is easily spread, reduces land for grazing, and very costly. If we can stop the fireweed growth early on it would be easier for us to eradicate it from Hawaii. Which is very important considering people livelihood and the state economy could be effected. If we help the state and the ranchers it will in turn helps us by reducing costs and let the 2 million be spend on something else such as construction. One way people can help is to speak up and call Hawaii Department Of Agriculture whenever you see the plant. It will also be in our favor to volunteer work or find other ways to combat the spread of the Madagascar Fireweed. Although the predator of the plant has been working better than expected it is essential to keep up our own efforts in order for the plants to be eradicated from Hawaii.