

WEED OF THE WEEK

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A feature on KKCR's "Back to the Garden" radio program

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FEATURED SPECIES: MULE'S FOOT FERN (*Angiopteris evecta*)

In August, we featured the Australian Tree Fern, now one of Kaua'i's most infamous invasive species, with an escape from cultivation that has resulted in shocking aerial photos of its spread into some of Kaua'i's most pristine areas. But, there is another, lesser-known tree fern that also deserves our attention, which is today's Weed of the Week: Mule's foot fern.

Mule's foot fern was first brought to the Hawaiian Islands in 1927 to showpiece at Lyon's Arboretum in Mānoa Valley on O`ahu. It not only began spreading in the Arboretum, but has since escaped cultivation into the Ko`olau Mountains and the Maunawili area. With fronds that stretch out to 10 feet long and 3 feet wide, this tree fern has a massive footprint in the forest, overshadowing the surrounding native species. A native dominated ecosystem that becomes infested with mule's foot fern would lose biodiversity in its understory and the opportunity for regeneration, since keiki plants would not be able to thrive underneath the shadow of the mule's foot fern's span.

The story of mule's foot fern in Hawai'i brings up an important point about the role and responsibility of botanical gardens and arboretum in preventing the horticultural invasions. Missouri Botanical Garden convened a summit (check out the proceedings at http://www.centerforplantconservation.org/invasives/Download%20PDF/Proceedings_FI_NAL.pdf) on this issue, which led to the genesis of the Voluntary Codes of Conduct. There are codes specifically designed for botanical gardens and arboreta. The commitments are as follows:

1. Conduct an institution-wide review examining all departments and activities that provide opportunities to stem the proliferation of invasive species and inform visitors.
2. Avoid introducing invasive plants by establishing an invasive plant assessment procedure.
3. Consider removing invasive species from plant collections. If a decision is made to retain an invasive plant, ensure its control and provide strong interpretation to the public explaining the risk and its function in the garden.
4. Seek to control harmful invasive species in natural areas managed by the garden and assist others in controlling them on their property, when possible.
5. Promote non-invasive alternative plants or, when possible, help develop non-invasive alternatives through plant selection or breeding.
6. If your institution participates in seed or plant distribution, including through Index Seminum, do not distribute known invasive plants except for bona-fide research purposes, and consider the consequences of distribution outside your biogeographic region. Consider a statement of caution attached to species that appear to be potentially invasive but have not been fully evaluated.
7. Increase public awareness about invasive plants. Inform why they are a problem, including the origin, mechanisms of harm, and need for prevention and control. Participate in developing, implementing, or supporting national, regional, or local early warning systems for immediate reporting and control. Participate also in the creation of regional lists of concern.

8. Botanical gardens should try to become informed about invasiveness of their species in other biogeographic regions, and this information should be compiled and shared in a manner accessible to all.
9. Become partners with other organizations in the management of harmful invasive species.
10. Follow all laws on importation, exportation, quarantine, and distribution of plant materials across political boundaries, including foreign countries. Be sensitive to conventions and treaties that deal with this issue, and encourage affiliated organizations (plant societies, garden clubs, etc.) to do the same.

Although nurseries and botanical gardens have been a source of invasive species in the past in Hawai'i, many are taking action to become leaders in preventing future invasions. Lyon's Arboretum, along with the National Tropical Botanical Garden (NTBG) here on Kaua'i, signed on to these voluntary codes of conduct.

NTBG works in their gardens and Limahuli preserve to remove and control invasive species, and, as promised in the codes of conduct, have even de-accessioned some species known to be invasive.

The distribution of Australian tree fern is at a pretty daunting level on Kaua'i, but we can learn a valuable lesson from this scenario. Like Australian tree fern, mule's foot fern has small spores that are easily swept away from our gardens by the wind up into the forest. Already, mule's foot fern has been spotted in the remote, native-dominated areas in the back of Wainiha and Limahuli Valleys. Field crews are staying on top of it and removing them as quickly as possible before populations explode, but they need our help.

During the nursery and roadside surveys on Kaua'i, conducted by NTBG and the Kaua'i Invasive Species Committee, mule's foot fern was still found to be on sale in nurseries. In their voluntary codes of conduct, the O'ahu Nursery Grower's Association included this species on their "do not sell list" but it did not make it on the Kaua'i Landscaping Industry Council's (KLIC) list at the time. The Hawai'i Association of Landscape Architects has promoted an extended list of over 100 plants, including mule's foot fern, to remove from the statewide industry, which KLIC is currently reviewing.

For our part, we can remove mule's foot ferns from our garden. This is a real opportunity for us to be proactive on Kaua'i and prevent another "Australian tree fern-like" invasion. Field crews already have enough weedy tree ferns to battle in the forest! If you need help identifying your ferns, check out the images on our website or photos by Forest & Kim Starr at <http://www.hear.org/starr/plants/images/species/>. You can always email the "Ask a Botanist" program at NTBG for extra identification help as well at outreach@ntbg.org.

NATIVE GARDEN ALTERNATIVE:

Well, once you remove the mule's foot fern from your garden, you need something to fill that big gaping hole, right? We have some wonderful native, tree ferns here in Hawai'i that you can put in there. `Ama`u (*Sadleria cyatheoides*) is an endemic beauty. Its new fronds come in with a salmon hue that brings a lot of color to the garden. You can learn more about `ama`u at

<http://www2.bishopmuseum.org/ethnobotanydb/resultsdetailed.asp?search=amau>

And see pictures at

<http://www.hear.org/starr/plants/images/species/?q=sadleria+cyatheoides>

