

Japanese Dodder, *Cuscuta japonica*, control & eradication efforts in Alameda County 2015 to 2017.

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Summary

Over the last decade, Alameda County along with other regions of California have experienced recurring sporadic infestations of *Cuscuta japonica*, Japanese Dodder. Japanese Dodder is a parasitic plant of foreign origin with purported medicinal uses used by certain south-east Asian cultural communities. The plant is spread by direct movement of strands by people or wildlife, which attaches to a susceptible host and rapidly grows and overtakes the host. Japanese Dodder is CDFA A-rated and is subject to quarantine enforcement action. Infestations of Japanese Dodder are mechanically removed by affected property owners under departmental supervision. Disposal by deep burial of infested host material at the landfill is required by quarantine regulation resulting in labor-intensive removal projects. To date, Japanese Dodder has been found primarily in urban residential neighborhoods and associated parklands, but this pest poses a serious threat to natural resource areas if spread occurs to remote or inaccessible areas or other high value sites. State eradication funding for Japanese Dodder was terminated in 2011. Local agencies have worked cooperatively since then with affected property owners to maintain control of the pest locally. In 2015 the Alameda County Department of Agriculture was awarded funds by the US Forest Service and CDFA to support ongoing eradication efforts in Alameda County. During this period over 20 infestations have been removed by departmental staff in cooperation with agency collaborators and affected property owners. During this work, *In-situ* control of the pest with herbicides with successful host recovery has been observed. Alternative control strategies are also proposed to assist affected owners greater flexibility for disposal and treatment.



Extensive Live Oak infestation on private property. Photo, August 2015



Voluntary removal by owner with hired vendor. Agriculture Dept. hauled material to disposal site February 2016.



Sustained control. Top photo, June 2016. Bottom photo, August 2017.

Background

Japanese Dodder, *Cuscuta japonica* is a parasitic vine of the Convolvulaceae (alternatively Cuscutaceae) known to originate from Southeast Asia. The plant has purported medicinal properties and is illegally transported and cultivated for such uses. Locally it appears the plant is moved primarily by direct movement of plant strands from infected hosts by persons or wildlife and placed on other susceptible hosts where it rapidly binds via haustoria and begins rapid vegetative growth on the new host. Plants have been observed to flower in California, but no fertile flowers or propagules have been observed to date. If left unattended the parasite can kill the host within 2 to 3 years and pose a greater risk of spread during that time. To date, infestations in Alameda County have been almost entirely located in residential neighborhoods on ornamental plantings, and due to the lack of funding or coordinated statewide eradication program, is a lower regulatory priority as compared to other high profile regulatory pests. However, Japanese Dodder is a great public nuisance to local communities and affected property owners. If the pest is moved to high value natural resource sites, forested lands, or inaccessible areas, it could be a tremendous problem for resource managers. Control of Japanese Dodder involves direct physical removal of the host, or killing the host with herbicides, followed by landfill disposal as required by quarantine regulations.

Example of successful host recovery (*Hedera sp.*) with limited mechanical removal of infested portions and repeated *in situ* herbicide (glyphosate 1 to 2%) treatments of parasite regrowth.



Initial confirmation August 2013. Owner removal attempts by contracted landscaper unsuccessful.



Regrowth April 2015



Regrowth December 2015



Successful kill of parasite with *in situ* herbicide treatments April 2016



Sustained parasite death and host regrowth August 2017



Street tree removals in cooperation with City of Oakland Public Works Dept, Tree Services Division 2016 & 2017

Medicinal Uses?



Example of purported medicinal uses of Japanese Dodder found on internet. Research is warranted on possible medicinal properties of this plant for possible pharmaceutical advances and also to protect public health

Project Work

Since 2006 approximately 50 Japanese Dodder infestations have been detected in Alameda County. Almost all infestations have occurred in the City of Oakland along with two outlier sites. One infestation has been found in the City of Berkeley and another at the northern county bordering Contra Costa County in approximately 2006. State Eradication funding was dropped in 2011. Since 2011 Alameda County has worked collaboratively with affected property owners and other local agencies to remove infestations on a voluntary basis under departmental supervision. In 2012 The Alameda Department of Agriculture/Weights and Measures received an award from the U.S. Forest Service, State and Private Forestry Program and CDFA to support ongoing eradication efforts. Since 2011, there have been approximately 20 infestations of Japanese Dodder on public and private properties. To date, all previously known infestations have been removed and treated with the exception of two new detections in recent weeks. With the completion of this project work, ongoing facilitated removal with affected property owners will resume as needed until additional funding sources can be obtained. Official abatements may be sought if circumstances warrant such action. For example if Japanese Dodder is found at high value natural resource sites. If ongoing removal efforts are not maintained this pest will likely resurge in dramatic fashion.



Early reports and confirmation August 2013. Repeated voluntary attempts of removal by owner unsuccessful.



Complete final removal by Alameda County Department of Agriculture/Weights & Measures Department October 2015. Initial street tree removal by City of Oakland (not shown). Site monitoring ongoing.



Example of successful host recovery (*Nerium oleander*) with mechanical removal of infested material and repeated *in situ* herbicide treatments of regrowth. Left photo, April 2015. Right photo, August 2017.



Left, Large infestation *Liquidambar* Fall 2014. Right photo, August 2017.



Observations & New Questions?

- Japanese Dodder control and host recovery was observed in hardy ornamental host material (*Hedera spp.* and *Nerium oleander*) with repeated *In situ* glyphosate treatments (1 to 2% glyphosate) following gross mechanical removal. This method provides a reduced-effort, less-destructive alternative to complete mechanical removal of infested hosts, or intensive herbicide treatments.
- Japanese Dodder has not been observed to produce fertile flowers (or fruit) in California. Tarped chipped loads of infested woody material decay rapidly and do not appear prone to natural movement or reinfestation of new hosts provided they remain isolated for sufficient time for the dodder to die or decay. Therefore tarped, isolated material should be safe to dispose of in greenwaste streams approved for other agricultural pests (e.g. SOD, LBAM, ACP) instead of by deep burial in a landfill as required by standard quarantine procedures. In the absence of a formal statewide eradication program, this strategy could provide greater flexibility for disposal of infested material by affected property owners with reduced regulatory oversight and effort.
- Could repeated pressure steaming of infested hosts in residential or urban settings provide an alternative to mechanical removal or herbicide treatments in appropriate locations?

References & Resources

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