

PACIFIC SOUTHWEST Forest and Range Experiment Station

CONTROLLING FIRETREE IN HAWAII BY INJECTION OF TORDON 22K

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USDA Forest Service
Research Note PSW-217
1970

Firetree (*Myrica faya* Ait.), an introduced tree species, has naturalized aggressively in Hawaii. On the island of Hawaii alone, a survey in 1967 by the State Department of Agriculture showed that this non-commercial species had infested more than 40,000 acres of range and forest lands. This plant pest must be controlled if land is to be reclaimed for planting to more desirable range and timber species.

Before large-scale and costly control programs are undertaken, effective and practical techniques must be developed. Akira Kawasaki and Robert Kami of the Hawaii Department of Agriculture demonstrated in 1967 that firetree can be killed by injections of Tordon 22K¹ (4-amino-3,5,6-trichloropicolinic acid) silvicide. To elaborate on their results and to develop cost information, the Experiment Station and the Hawaii Division of Forestry set up a firetree control study in 1967.

We found that injecting Tordon 22K into firetree is an effective method of controlling this aggressive plant pest. The method can give rapid and complete canopy kill of firetree and 99 percent control of firetree sprouting. But ways to reduce treatment costs should be investigated before the technique is used operationally on a wide scale.

METHODS

The study site is in a heavy infestation of firetree on the Hamakua Forest Reserve, island of Hawaii, at 2,200 feet elevation. Rainfall averages about 80 inches annually. Topography is undulating, with the major slope being north at about 10 percent. The soil has been mapped as Honokaa silty clay loam.

A 2-acre site, measuring 2-chains by 10-chains, was laid out in a dense firetree stand—about 650 stems per acre. Firetree averaged about 55 feet tall and 12.7 inches basal diameter. Basal sprouts, ranging in number from 1 to 8 per tree, were growing from about 20 percent of the firetrees. Machetes and hand

ABSTRACT: Firetree (*Myrica faya*) has infested more than 40,000 acres of range and forest lands in Hawaii. If the land is to be planted to more desirable range and timber species, this plant pest must be controlled. In trials on the Hamakua Forest Reserve, island of Hawaii, firetrees were effectively controlled by squirting Tordon 22K into notches cut by machetes. The treatment gave complete canopy kill, and 99 percent control of sprouting. The cost of silvicide to treat each stem was about 5 cents.

OXFORD: (969):441-414.26 Tordon 22K:176.1 *Myrica faya*.

RETRIEVAL TERMS: *Myrica faya*; Hawaii; weed control; Tordon 22K.

axes were used to notch the stem at heights from 6 to 18 inches above the ground. Notches were cut 3 to 5 inches apart around the stem. All firetree stems within the site were treated by applying undiluted Tordon 22K to freshly cut notches. The silvicide, from 1 to 3 ml. per notch, was applied with hand-operated oilers (*fig. 1*). The few firetree seedlings and saplings were pulled out or cut.

Within the treated site, we set up six sample plots, each 1/40 acre. The number of treated trees and the number of injections per tree were recorded. The treated trees were evaluated 1, 2½, 6, and 12 months later.



Figure 1—Tordon 22K was injected undiluted into a notched firetree. Its effects were apparent after a month—foliage turned brown and basal sprouts were defoliated.

RESULTS AND DISCUSSION

Treatment Effects

The initial effects of injecting Tordon 22K into firetree were apparent after 1 month. By then about 10 percent of the canopy foliage had turned brown, and about 80 percent of the basal sprouts were defoliated.

After 2½ months about 77 percent of the stems were completely defoliated, and what canopy foliage remained was brown. But the stems of these trees were still green. All basal sprouts were defoliated, and most of the sprout stems were dead.

Six months after treatment the firetree canopy foliage was completely gone, and most stems were dead. Some of the firetree bases remained green, but no sprouts were observed. One sprout developed from a non-treated cut sapling.

During the next 6 months sprouts developed from the bases of 12 trees—less than 1 percent of the trees treated. Enough silvicide apparently was still present to affect the sprouts—85 percent of the sprouts showed leaf curl and browning.

Only one 6-inch firetree seedling was recorded in the treated area after 1 year. The dense growth of herbaceous vegetation that has become established has probably prevented the establishment of other firetree seedlings.

The complete canopy kill (*fig. 2*) and the 99 percent control of sprouting suggests that injection of Tordon 22K is an effective method of controlling firetree.

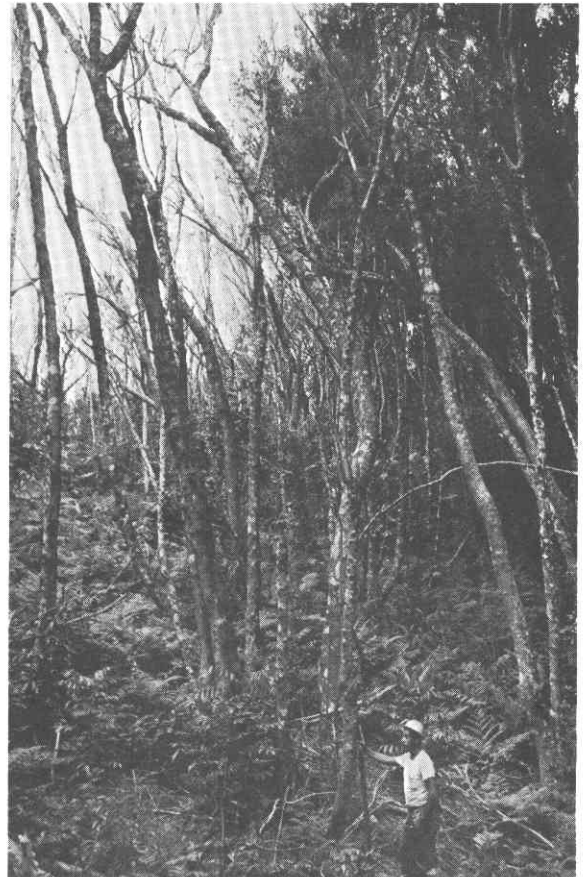


Figure 2—Tordon 22K-injected firetrees 1 year after treatment stand stripped of foliage in contrast to untreated trees outside the study site.

Treatment Costs

About 30 man-hours were spent injecting about 1,300 firetree stems or about 15 man-hours per acre. An average of 3.5 injections were made per stem. About 1 gallon of Tordon 22K was used per acre. If the price of Tordon 22K is assumed to be \$31 per gallon, cost of silvicide to treat each stem averaged about 5 cents.

Treatment costs could probably be reduced by using more efficient and accurate injection methods

and by using diluted Tordon 22K. Using a single-operation instrument, such as the newly developed hypo-hatchet, instead of the cut-squirt method should reduce treatment time.

NOTES

¹Mention of the trade name Tordon 22K is solely for information. No endorsement by the U.S. Department of Agriculture is implied.

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is conducted in cooperation with
Division of Forestry
Hawaii Department of Land and Natural Resources



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