CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)

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Project Number

J1716

Project Title

Saving Coastal Sage: Methods of Eradicating Invasive Fennel (Foeniculum vulgare)

Abstract

Objectives/Goals

Fennel has invaded the coastal sage scrub that covers a portion of my property. Coastal sage scrub is an endangered ecosystem that supports a number of endangered species. I wondered what would be the most effective way to eradicate fennel from coastal sage scrub. I knew I could use herbicides, but I hoped to find another solution. I researched and found that digging up 10 cm of each fennel plant's bulb at the top of the root would be a way to eliminate the fennel. My hypothesis was that this method might be difficult to carry out, but both effective and more environmentally friendly than using herbicides.

Methods/Materials

I tested 120 fennel plants. I divided the plants into 6 experimental groups. In one group I tried digging up the root, in another I cut the stalks, in two other testing areas I sprayed two different types of weed killer, and then I tried my own idea which involved applying two different concentrations of a urea solution. I checked the fennel plants every other day for 80 days to see how the fennel plants responded to the various treatments.

Results

After cutting the stalks of 20 fennel plants twice, none of these plants were successfully eradicated. In contrast, digging up the taproot of the fennel was 95% effective. The first type of weed killer (Roundup Weed and Grass Killer) eradicated 85% of the plants, while the second type of weed killer (Roundup Tough Brush Killer) eradicated 80%. The first urea solution (24 ppt), only killed 5% of the fennel. A second solution (240 ppt) only eliminated 15% of the fennel plants.

Conclusions/Discussion

Digging up 10 cm of the taproot was the most effective method of eradication. I hypothesized that it would be difficult to dig up the taproots, but I found that after heavy rain the plants can be pulled up easily and without disturbing the soil. Roundup was effective in killing the fennel plants, but is a non-selective herbicide, and it was difficult to avoid killing some of the native plants around the fennel testing areas. I was incorrect in hypothesizing that the urea solution would be effective in eradicating the fennel, although regrowth did lessen slightly. Plants whose stalks were cut twice continued to grow, as I expected.

Summary Statement

This project involved testing six methods of eradicating invasive fennel from an area of endangered coastal sage scrub.

Help Received

Maryanne Bache, Education & Outreach Director at the San Elijo Lagoon Conservatory, gave me information about fennel.