Assessing the most effective weed control re-treatment interval for *Clidemia hirta* dominated areas at Opaepula Lower Management Unit, Oahu

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Introduction

• A trial to guide *C. hirta* weed control at Lower Opaeula
• To what extent does *C. hirta* and other weed taxa rebound if an area is not re-weeded for 6, 12 or 18 months?
• How does species richness change in response to weeding at different intervals?
• Is re-weeding at 6 months harmful to natives?
• How long does it take for <10 cm tall *C. hirta* plants to become reproductive?
• Does canopy cover change in response to understory weeding within 18 months?
Methods

• Understory cover (point intercept, n=80)
• Species richness (1m$^2$ quadrats, n=20)
• Canopy openness (hemispheric photography, n=20)
• Weed treatments (5 x 21m plots)
   - Plot 1: control plot – not weeded
   - Plot 2: weeded at 0 & 6 months
   - Plot 3: weeded at 0 & 12 months
   - Plot 4: weeded at 0 months
• Maturation time (tagged plants <10cm in 5 x 5m plot, n=50)
Results: Understory percent cover

*Significant, **marginally significant before/after; Letters: significant difference between plots (chi-square and Fisher’s exact tests)
Results: Species richness

*Significant, **marginally significant before/after (t-tests); Letters: significant difference between plots (ANOVA with Tukey’s post-hoc comparisons)
Results: Canopy openness

Letters: significant difference between plots (derived using Gap Light Analyzer (GLA), Version 2.0 software (Frazer et al. 1999); ANOVA with Tukey’s post-hoc comparisons)
Results: Maturation time

• Tagged small plants (n=50):
  • 1 mature by 12 mo.
  • 43% mature by 18 mo.

• Weeded plots:
  • Plot weeded 6 mo. prior had mature plants
Summary and Recommendations

• By 18 mo., *C. hirta* cover ↓ and native cover ↑ if re-weeded 6-12 mo. later, but cover and richness of other weeds ↑

• *C. hirta* minimum time to maturation is < 6 months, and may be influenced by light availability

➢ Re-weeding (including grass control) should occur within 6 to 12 months, in order to allow native cover to expand, prevent weed cover from returning to near prior levels, and limit new *C. hirta* seed rain. Caution advised for canopy weeding.
Thoughts?

Better trial designs?

Interpretation of results?

Pros/cons of increased native cover with increased weed richness?