

I. Ecology of weeds in perennial crops

A. *Old field succession*

1. Succession of plant communities after bare ground due to fire, landslide, floods or human activity.

a) **Weedy species follow bare ground condition.**

(1) Broadleaf weeds

(a) Spiny amaranth, pig weeds, honohono, Asiatic dogtail and other succulent broadleaves,

*(b) Legumes: rattle pod, sensitive plant (*Mimosa pudica*), Japanese tea*

(2) Grassy weeds

(a) Large perennials: guinea grass, CA grass, Natal redtop, paspalums, other panicums

b) **Woody plants follow succulent grasses and broadleaves**

(1) Guava, silk oak, tulip tree, ironwood, java plum and nearby banyons.

c) **Unattended lots:**

(1) Plants will occupy a site without human intervention and spring from soil bank of weed seeds, seed deposited in runoff from adjacent lots, wind blown seed and animal shit.

(2) All these plants can interfere with productive forest establishment.

(3) Weeds can serve as good ground covers but present problems with overrunning forestry species and making other cultural practices difficult.

II. Forest establishment with ground covers

A. Preparing the forest site for ground cover establishment

1. Removing unwanted vegetation

a) Bulldozer to scraps weeds and topsoil into gulches, start farming the sub soil, most common form of land preparation but worst for plant growth.

b) Fence off site, graze animals to establish a solid stand of lower growing grasses.

(1) Ideal to mow first to get soft succulent growth

c) Mow weeds and spray regrowth

(1) 2 or more applications depending on plant community

(2) Drought stressed weeds nearly unresponsive to systemic herbicides.

B. Identify best-suited ground cover.

1. Seeding ground covers

a) Require high seeding rates to keep weeds out

b) Surface seeding makes good bird feed, consider drilling

c) 3-9 months of cover

(1) mix oats and rye grass, 100 LB/a of both

(a) this mix will be overcome by larger warm season grasses with rainfall and summer heat.

d) 1-5 year cover with seeded Bermuda or buffel

(1) will fade away under shade of maturing forest.

e) Any legume of short stature requires weed control to work. Hard to make them work on large scale plantings.

2. Vegetative materials require specialized equipment, timely planting and water

a) Tropic Lalo for wetter areas

b) Perennial peanut needs good water supply, pigs will work it and expose soil.

c) Native HI grasses ok, seed in sufficient amount hard to come by.

d) Weeds as ground cover

(1) Mowing will select lower growing types, mostly likely get Hilo grass in rainy areas.

(2) Select grasses with Garlon 4E, kills many broadleaf weeds.

C. Preparing the planting rows

1. Layout planting rows with stakes and string and burn down in row vegetation with contact herbicides

a) Use shield spray to maintain cover between rows, may have to repeat 2 times

b) Apply pre herbicides like Goal with surfactant to increase contact burn in rows. Kills germinating weeds seedlings too.

2. Fertilize heavily to produce high biomass, then mow and blow before seeds form.

a) Cut weeds are windrowed into planting rows with forage chopper.

b) Continue mow and blow until in-row mulch layer is high enough to suppress weeds.

c) Spray mulch row if clippings roots, when all dead plant crop.

D. "Hawaiian Specia", I forestry establishment using grassy weeds as ground cover.

1. Prep site to bare ground and grade for safe tractor movement.

2. Broadcast fertilization for rapid growth and uniform seed germination.

- a) **Use at least 50-100 lb N/a.**
3. Kill broadleaf weeds with broadcast application of Garlon 4E.
 - a) **Some research needed to find a kill rate that leaves the grasses growing.**
 - b) **Spray before weeds they overgrow each other.**
 4. Band Roundup to make planting rows, use shielded sprayer to maintain between row cover.
 5. Mow and blow grasses to crop row to build up mulch layer
 - a) **Fertilization of ground cover very important to get high levels of biomass for in-row mulching**
 - b) **Forage harvester needed for large scale mowing with directed mulch placement.**
 6. With sufficient mulch in row, plant crop.
 7. Chemically stunt mowed grasses with Fusilade DX to maintain low height.
 - a) **Safe for over the top spray on most forest species. Aerial application ok (on label).**