Initial evaluations of native Hawaiian plant introductions to stabilize the ecosystem against weed invasions at MA‘O Organic Farm

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The 3-step process to holistic weed management :

1. Identify the conditions of a healthy environment and those conditions that have been altered by the weed invasion.

2. Integrate interventions against the weed with improvements to those altered conditions of the landscape.

3. Stabilize the ecosystem to promote the occupation of desirable plant communities to work against reoccurring weed infestations.

December 2007

Initial site preparation with chisel plow surface scarification

Extremely rocky site dominated by C4 grasses (Stable ecosystem?)

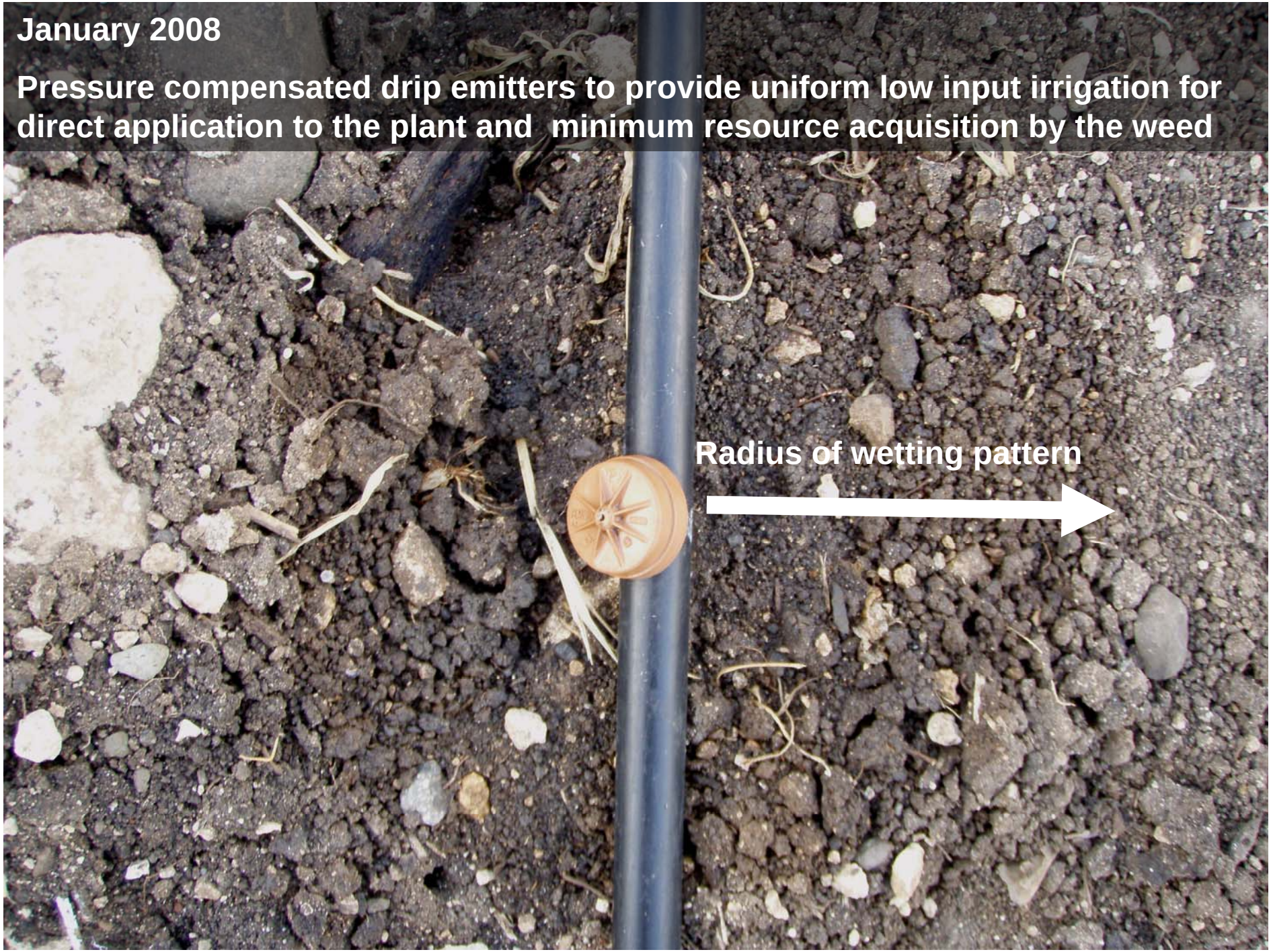
Notice how lush surrounding grass vegetation is in response to the wet winter (Identifying seasonal conditions)

Disturbance to the site resulting in a flush of annual broadleaf weeds and grasses (exacerbation of weed invasions without an integrated approach)

January 2008

installation of surface drip Irrigation


January 2008
Drip heads spaced 0.5 m apart


January 2008
Pressure compensated drip emitters to provide uniform low input irrigation for direct application to the plant and minimum resource acquisition by the weed
Radius of wetting pattern

February 2008

Reusable woven weed mat covering the site to prevent further weed ingress prior to outplanting

Rocks coming in handy after all! (utilizing local resources)


May 2008
Weed mat shifted to expose planting rows
Loving those rocks!

May 2008 untreated control


June 2008 untreated control

July 2008 untreated control

Aug 2008 untreated control 1month after hand weeding

Oct 2008 untreated control 3 months after hand weeding

May 2008 naupaka


June 2008 naupaka


July 2008 naupaka

Aug 2008 naupaka 1 month after hand weeding

Oct 2008 naupaka 3 months after hand weeding

May 2008 nanea


June 2008 nanea

July 2008 nanea

Aug 2008 nanea 1 month after hand weeding

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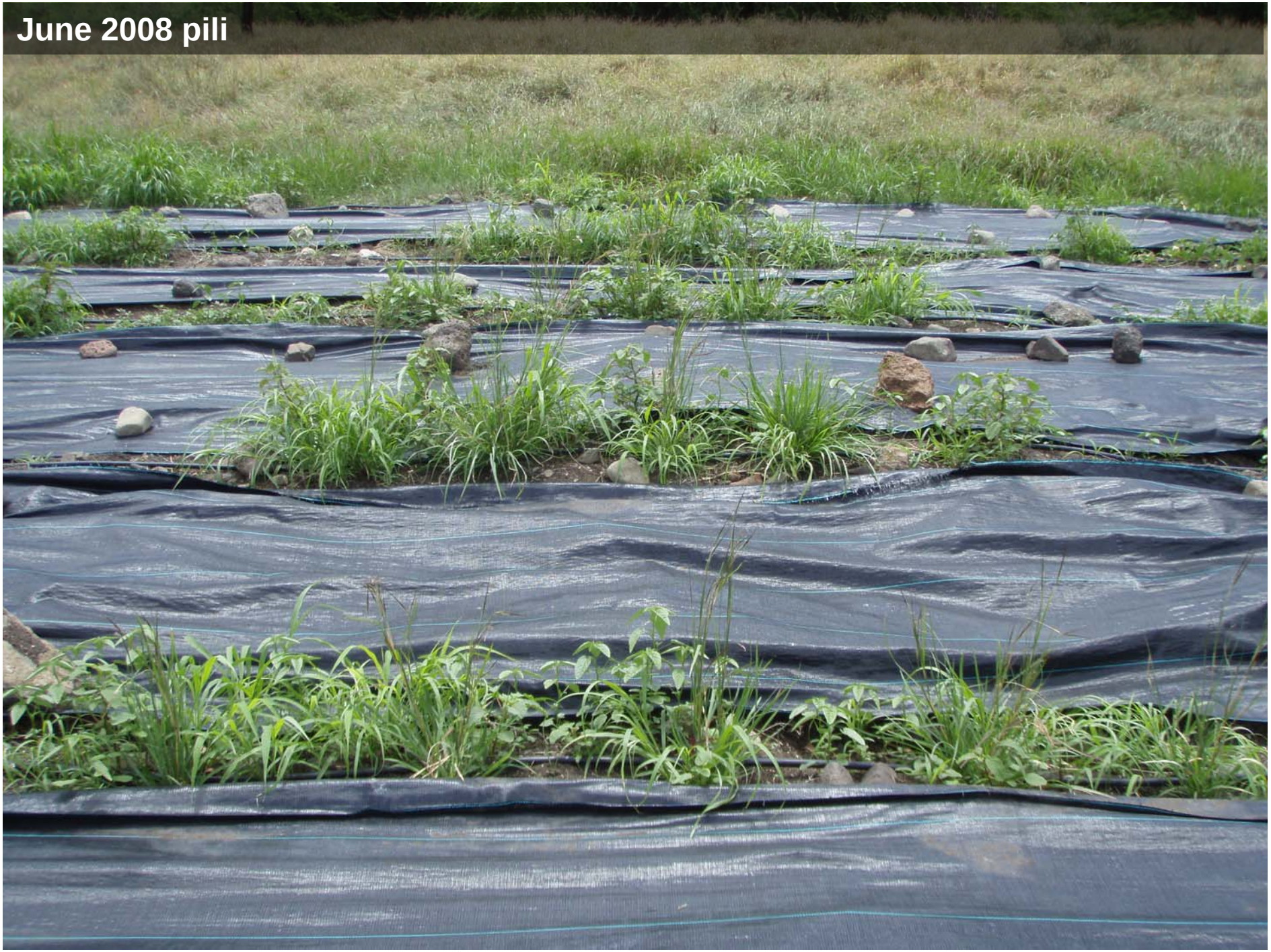
May 2008 pili

June 2008 pili



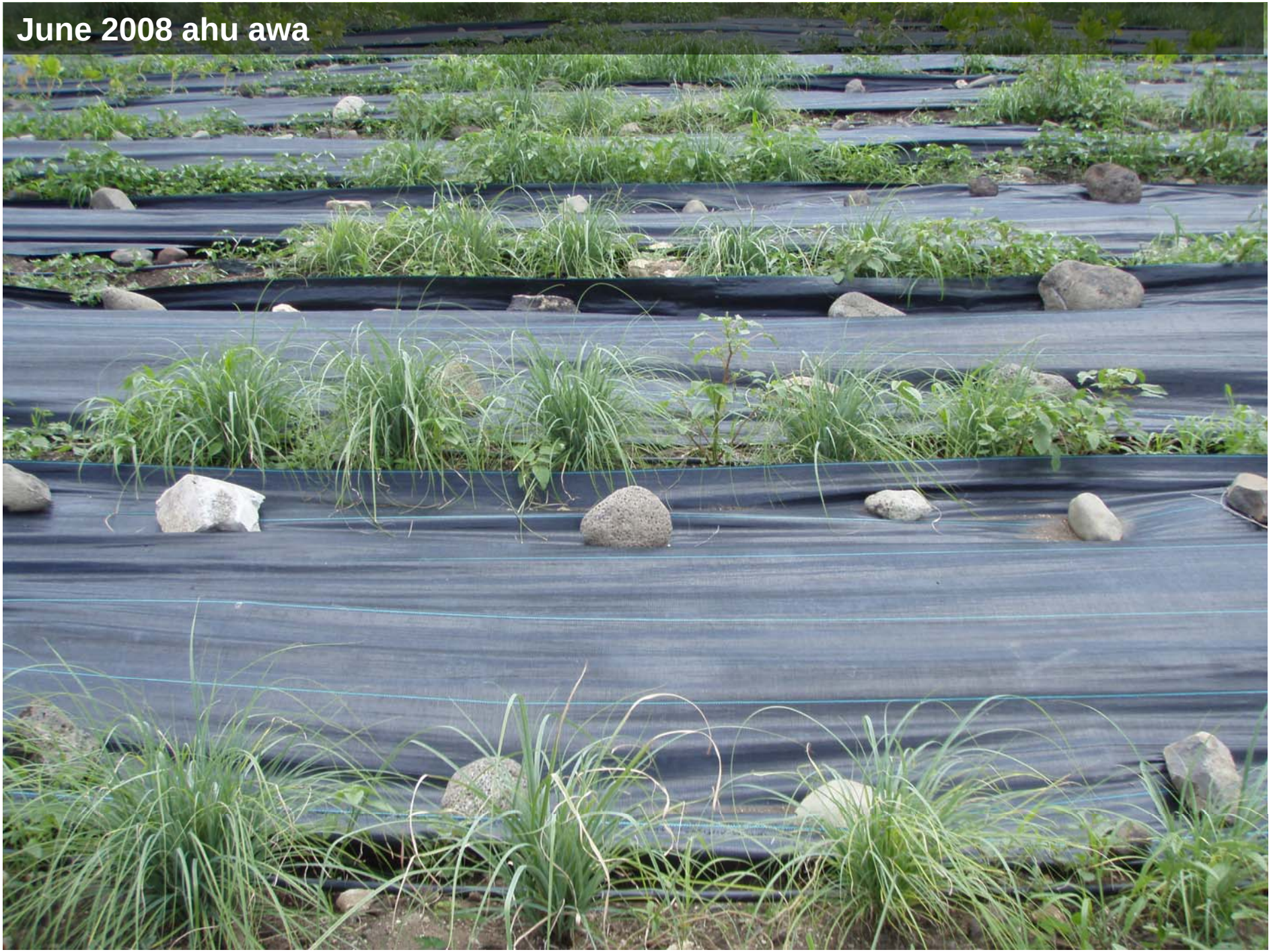
July 2008 pili

Aug 2008 pili 1 month after hand weeding

Oct 2008 pili 3 months after hand weeding


May 2008 ahu awa

June 2008 ahu awa

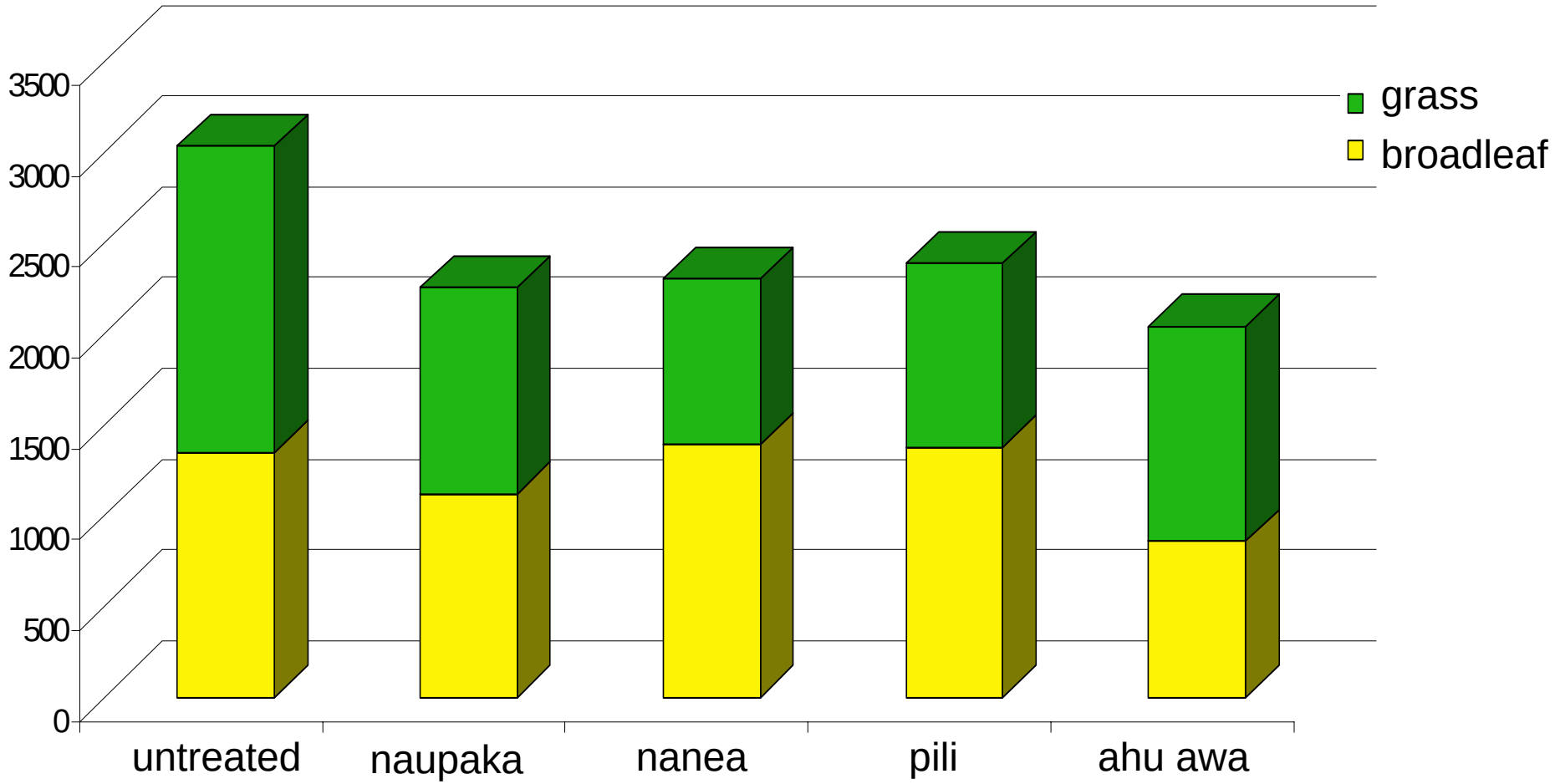


July 2008 ahu awa

Aug 2008 ahu awa 1 month after hand weeding

Oct 2008 ahu awa 3 months after hand weeding

Grass and broadleaf weed dry wt calculated for each treatment from July 2008 harvest estimated in kg ha^{-1}



Conclusions:

1. **Maintaining a bareground system is a never ending battle against the laws of entropy. Something must occupy this ecosystem niche**

2. **Native plant introductions have stabilized the ecosystem through niche occupation resulting in weed reductions.**

3. **The monocots appear to perform better in niche occupation than the selected dicots for this trial.**

4. **How will crops perform in an intercropping system with these native selections?**

Stay tuned!

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