Cover crop cocktails for Hawai‘i

O‘AHU RESOURCE CONSERVATION & DEVELOPMENT COUNCIL

USDA

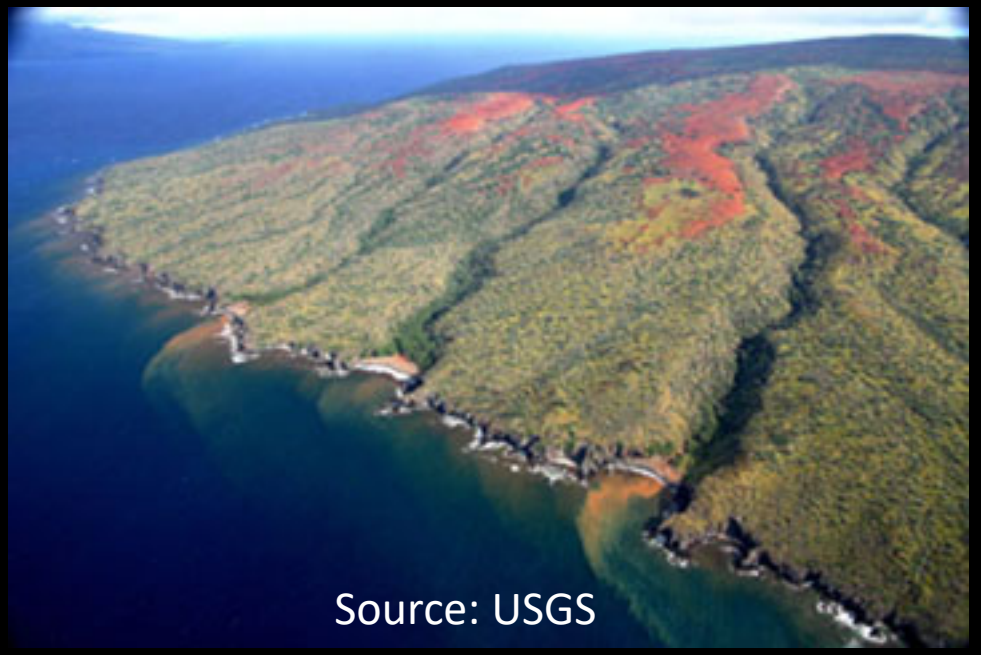
United States Department of Agriculture

National Institute of Food and Agriculture

WESTERN SARE

Sustainable Agriculture Research & Education


CRAMP
Source: CRAMP


Source: USGS

Cover Crops WORK!

- Reduce soil erosion and nutrient leaching
- Fix nitrogen (green manures)
- Build organic matter in soil
- Weed suppression / smothering
- Scavenge nutrients
- Increase water infiltration & improve soil tilth

Nitrogen fixation

Nutrient scavenging +
Weed smothering

Organic matter

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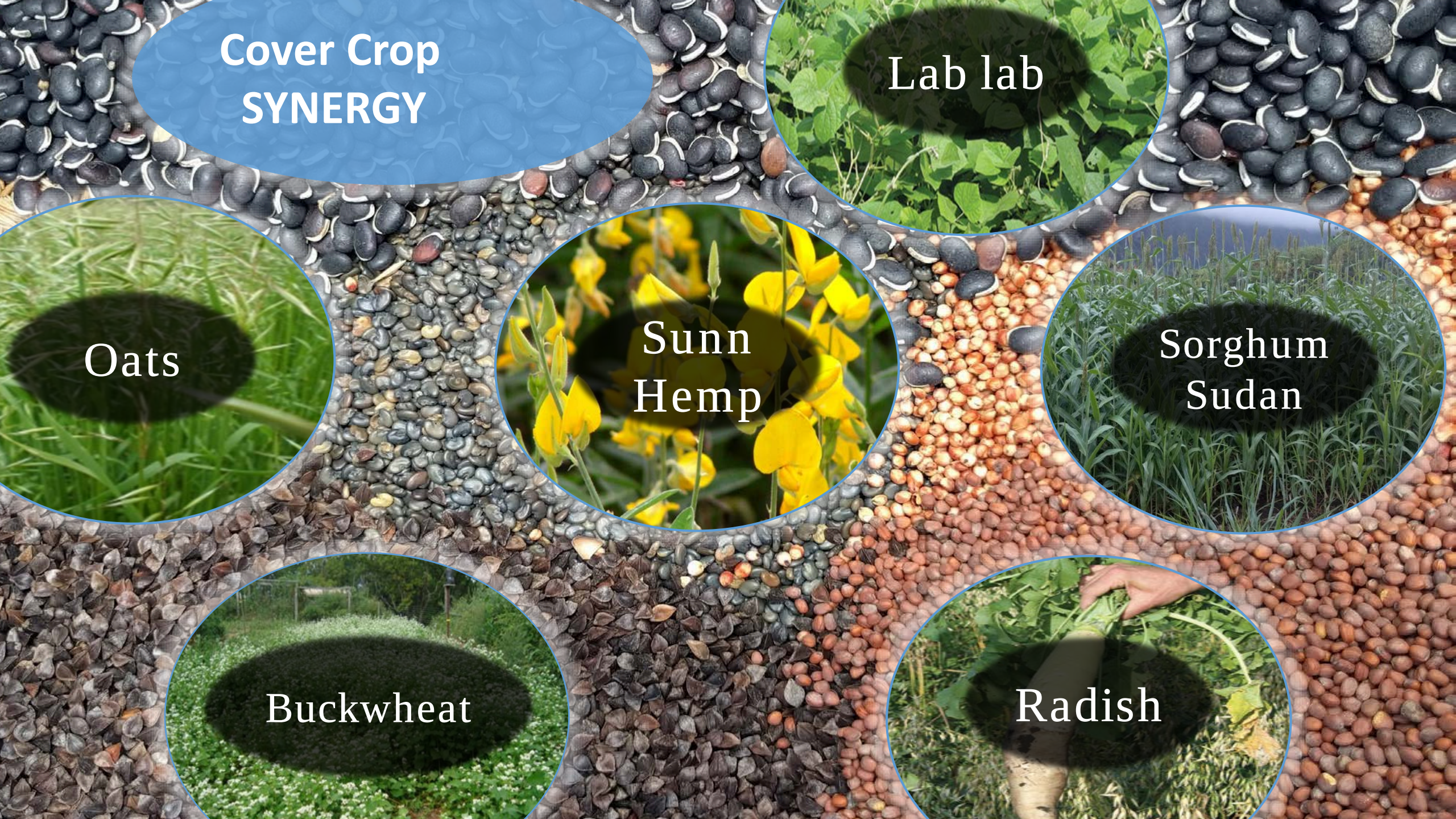
Cover Crops Cocktails WORK BETTER

- Diversified plant growth (above and below ground)
- Combine multiple species with useful traits for your system:
- Grass
- Legume
- Broadleaf


Cover Crop
SYNERGY
Lab lab
Oats
Sunn
Hemp
Sorghum
Sudan
Buckwheat
Radish


Source: www.soilwarrior.com

BUT things work a little different in Hawaii

- Higher soil temperatures = faster microbial breakdown of organic matter
- No hard freezes, no winter kill of cover crops (or weeds and pests)
- Diversity of growing conditions
  - Soils
  - Altitude
  - Cropping systems

Are cocktails worth it? Farmers will decide!

- Five farmer-researchers in different regions of O‘ahu conducting side-by-side trials of:
  - Single-species sunn hemp
  - standardized cocktail: sunn hemp, black oats & buckwheat
  - “tailor-made” cocktail customized by farmer for growing conditions
- Gain insights into:
  - Obstacles for cover crop cocktail adoption
  - Documents costs and benefits
  - Recommendations for seeding rates, field practices and equipment.

Who’s cover cropping in Hawai‘i?

- Specialty vegetable growers investing in long-term soil health
  - Limited equipment for terminating for broadcasting cover crops
  - Summer fallows
  - Limited availability of inputs
- Seed Corn Growers
- Orchard systems
  - Successional plantings during establishment
  - Perennial cover

Cover Crop Chart for Hawaii

Koon-Hui Wang and Archana Pant, CTAHR, University of Hawaii

CRATE

High Elevation ⟷ Low Elevation

Grass	Broadleaf	Legume	Legume	Legume	Legume	Legume	Broadleaf	Grass
A Black Oat 75 lb/acre							A R* Sesame 4 lb/acre	
A Barley 90 lb/acre							A Buckwheat 20-30 lb/acre	A Pearl Millet 15 lb/acre
A Cereal Rye 90 lb/acre	A Canola 7-10 lb/acre	A Hairy vetch 30-50 lb/acre	A Woolly pod Vetch 40-60 lb/acre	P Jack bean 50-60 lb/acre	('CA Blackeye 5', 'Purple knuckle', 'TS Brown', 'MS Silver') A Cowpea R 40-60 lb/acre	A Mustard 7-10 lb/acre	A Oat 90 lb/acre
A Oat 90 lb/acre	A Mustard 7-10 lb/acre	A Bell Bean 150 lb/acre	B Yellow Sweetclover 10-15 lb/acre	SP R* Velvet Bean 40 lb/acre	A Soybean 50-75 lb/acre	A S Rape Seed 7-10 lb/acre	A Black Oat 75 lb/acre
A Winter Wheat 120 lb/acre	A S Rape Seed 7-10 lb/acre	SP Red Clover 20 lb/acre	P White Clover 20 lb/acre	P Pigeon Pea 40-60 lb/acre	Lablab 11-18 lb/acre	A S Oil Radish 10 lb/acre	A Grain Sorghum 25-30 lb/acre
A Annual Ryegrass 100 lb/acre	A S Oil Radish 10 lb/acre	A R Austrian Winter pea 100 lb/acre	P ('Moapa 69') R Alfalfa 15 lb/acre	R Perennial Peanut 40 lb/acre	A R* Sunn Hemp 30-60 lb/acre	A R Marigold 3 lb/acre	A R Sorghum-Sudangrass 35-60 lb/acre

* = seedig rate

A = annual; B= Biennial; P = Perennial; SP = Short-term perennial.

R = resistant to root-knot but not reniform nematode; (note: only certain cultivars are resistant to root-knot nematodes for alfalfa and cowpea; cowpea is very susceptible to reniform nematode).

S = suppressive to plant-parasitic nematodes

R*= sunn hemp and velvetbean are resistant to root-knot and reniform nematodes; marigold, Tagetes patula, is resistant to root-knot and reniform, *T. erecta* is only resistant to root-knot; sesame is resistant to southern and peanut root-knot nematode (*Meloidogyne incognita* and *M. arenaria*) but not Javanica root-knot (*M. javanica*).

Cover Crop Resources

- oahurcd.org - cover crop manual (cocktail update coming in 2018)
- UH (Dr. Koon-Hui Wang): www.ctahr.hawaii.edu/sustainag/Database.asp
- NRCS: Pacific Islands Area Vegetative Guide

Get good seed!

- Local: Ko’olau Seed, Fukuda Seed & Moloka’i Seed
- Organic: Johnny’s, High Mowing & Grow Organic
- Online: GreenCoverSeeds.com

Want to Learn More?

- Saturday morning, Oct. 7 Field Day and Demo @ Kahumana Organic Farm
  - Waianae, O'ahu
  - Gabe Brown – mainland farmer & cover crop cocktail guru

- Other upcoming Oahu RC&D events & programs:
  - Women Farmers Workshop Series
  - Cacao Establishment Training Workshops (2018-2019)
  - HFUU members: workshops on Oct. 6 at UH West O'ahu

More information available on flyers