

Prescription for Soil Health by Cover Cropping for HI

For annual cropping systems

	Black oat	Sorghum/ Sudangrass	French Marigold	Sunn hemp	Velvet bean	Brown mustard	Sun-flower	Alfalfa	Cowpea	Lablab
Root-knot (RKN) and reniform nematodes	No allelopathic	Allelopathic	Allelopathic	Allelopathic	Allelopathic	Allelopathic; susc. to RKN	No Allelopathic	No Allelopathic	No allelopathic, susc. to reniform	No allelopathic susc. to RKN and reniform
High salinity	Tolerant	Tolerant	Moderately tolerant	x	x	x	Tolerant	Tolerant	Tolerant when old	x
Acidity (pH range)	4.5-7.3	5.5-8.5/ 5.0-9.0	6.0-7.0	5-7.5	<5.0 - 8.0	5.8-7.8	6.0-6.8	6.2-7.0	4.3-7.9	4.5-6.5
Suppress weeds	medium	✓	no	ok	✓	no	medium	slow	✓	✓
* Increase C ~0.4%/yr	Yes (yr 1)	Yes (yr 1)	No	No	Yes (yr 1)	No	No info	No info	No info	No info
Day length sensitive	Intermediate	yes	yes	yes	yes	no	yes	no	no	yes

(* Conservation tillage system)

Will not produce sufficient biomass in the winter

x = not tolerant



Sustainable Pest Management Lab
University of Hawaii at Manoa,
College of Tropical Agriculture and Human Resources

The combination of slow rates of soil carbon accumulation, high rates of organic materials degradation, year-round reproduction of soil-borne pathogens and nematodes, and year-round weed pressure pose obstacles to adopting conservation tillage and cover cropping in Hawaii. While many cover crops grow well in Hawaii, selecting the right cover crop for problematic soil can be more rewarding for soil health management. This chart provides some guidelines to select cover crops targeting on specific soil issues commonly encountered in Hawaii for annual crop production. Some cover crops possess allelopathic compounds that are naturally suppressive to plant-parasitic nematodes when soil incorporated or through root leaching into the soil. Special attention should also be paid to soil salinity and acidity in order for certain cover crops to establish. While farmers can take advantage of growing cover crops during the wet winter in Hawaii, some cover crops might not produce abundant biomass due to short days that result in early maturity. While growing cover crops in general could increase soil C to various extents, we present cover crops that have increased soil C by 0.4% more than bare ground controls in the subsequent cycle of cash crop growth in strip-till cover cropping system based on the recommendation from the [4/1000 initiative](#). There are other constraints to grow cover crops in Hawaii, this is to provide initial guidelines.

Acknowledgement

This project is in parts supported by NIFA OREI 20215130035225 and by CTAHR Hatch (HAW9042-H, 9048-H), Multistate (9034-R, NE2140) and Plan of Work (POW 16-964). We also thank the Oahu County Extension and farm crew for their technical assistance provided.

June, 2023

Koon-Hui Wang
Brent S. Sipes

Department of Plant & Environmental
Protection Sciences
University of Hawaii at Manoa



Brown mustard (Brassica juncea)



COOPERATIVE EXTENSION
UNIVERSITY OF HAWAII AT MANOA
COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES