

Relative Value of Cover Crop Species to Bees and Other Beneficial Insects

Cover Crop	Life Cycle	Seeding Rate (pounds/acre single species)	Seeding Depth (inches)	Honey Bee Value	Wild Bee Value	Beneficial Insect Value (predators and parasitoids)	Alternative Host of Crop Pests	Notes
GRASSES								
Annual ryegrass	Annual	10-20	½	None	None	Low	Unknown	Probably only useful to beneficial insects when included as part of a diverse seed mix
Barley	Annual	60-125	1½	None	None	Low	Oat and Russian wheat aphids, various small grain diseases	Best adapted to dry, cool (but not cold) climates
Millet (foxtail, proso and pearl)	Annual	5-25	½	None	None	Low	Unknown	Seeding rates for foxtail millet can be reduced to the lower end of the described range
Oats	Annual	60-120	1½	None	None	Low	Oat and Russian wheat aphids, various small grain diseases	Cool-season plant; limited cold tolerance with most varieties subject to winter kill in cold climates
Rye, cereal	Annual	60-120	1	None	None	Low	Russian wheat aphids, various small grain diseases	Potentially allelopathic to other crops
Sorghum/sudangrass	Annual	10-40	1	None	None	Moderate	Corn aphids	Attractiveness to grass-specific aphids may make this a useful insectary plant for attracting aphid predators (in non-grass crop systems); lower end of seeding rates are appropriate for sorghum and sorghum-sudangrass hybrids; potentially allelopathic to other crops
Teff	Annual	5-10	¼	None	None	Low	Unknown	Seed may have limited availability
Triticale	Annual	60-120	1	None	None	Low	Russian wheat aphids, various small grain diseases	Potentially allelopathic to other crops
LEGUMES								
Alfalfa	Perennial	10-25	¼	High	High	Moderate	Pea aphids	Top honey plant, also attractive to large numbers of diverse wild bees
Birdsfoot trefoil	Perennial	5-10	¼	Moderate	Moderate	Moderate	Spittlebugs, alfalfa plant bugs, potato leafhoppers and others	Can be weedy and invasive
Clover, berseem	Annual	8-20	¼	High	High	Moderate	Likely a host for various leafhoppers, true bugs and generalist aphids	Best adapted to Mediterranean climates
Clover, crimson	Annual	15-25	¼	High	High	Moderate	Pea aphids, tarnished plant bugs	Grows very well in combination with cereal rye and other cool season grasses
Clover, kura	Perennial	5-15	¼	High	High	Moderate	Various leafhoppers, true bugs and generalist aphids	Poor seedling vigor and slow to establish; considered a top honey plant

Clover, red	Perennial	5-20	¼	Moderate	High	Low	Various leafhoppers, true bugs and generalist aphids	Typically short-lived; high value for bumble bees
Clover, rose	Annual	10-25	¼	Moderate	High	Moderate	Various leafhoppers, true bugs and generalist aphids	Excellent bumble bee plant
Clover, strawberry	Perennial	5-15	¼	High	High	Moderate	Unknown	Can be weedy and invasive
Clover, subterranean	Annual	10-20	¼	None	None	Low	Pea aphids, tarnished plant bugs	Flowers are inconspicuous and do not attract pollinators
Clover, white	Perennial	5-15	¼	High	High	Moderate	Various leafhoppers, true bugs and generalist aphids	Considered a top honey plant
Chickpea	Annual	80-120	1½	Low	Low	Low	Pea borers, wireworms	Beneficial insects are attracted to extrafloral nectaries
Cowpea	Annual	30-90	1	High	High	High	Various stink bugs, leaf-footed bugs, aphids	Extensive extra-floral nectaries attract large numbers of beneficial parasitoid wasps as well as other beneficial insects
Fava bean	Annual	80-160	3	Low	Moderate	Moderate	Unknown	
Lablab	Annual	30-40	1-4	Moderate	Moderate	Moderate	Unknown	Vining growth habitat; more common in subtropical climates
Lupin	Annual	40-120	1-2	Low	Moderate	Moderate	Unknown	
Medic	Annual (a few species are perennial)	10-20	½	Low	Low	Low	Alfalfa weevils, pea aphids, tarnished plant bugs	Small, nondescript flowers attract few beneficial insects
Partridge pea	Annual	10-20	¼-¾	Moderate	High	High	Various leafhoppers	Extensive extra-floral nectaries attract large numbers of beneficial parasitoid wasps
Pea, field	Annual	50-100	2	Low	Low	Low	Tarnished plant bugs	
Sainfoin	Perennial	40-80	½	High	High	Moderate	Unknown	Considered a top honey plant
Soybean	Annual	35-120	1	Moderate	Moderate	Moderate	Wireworms, bean leaf beetles, potato leafhoppers and various others	
Sunn hemp	Annual	20-40	¾	Moderate	High	Moderate	Unknown	Attracts wild carpenter and leafcutter bees in tropical farm systems; supports parasitoids of corn earworm in the Pacific Islands region
Sweet clover	Biennial	6-20	½	High	High	High	Unknown	Considered a top honey plant; may be weedy or invasive in some areas
Vetch	Annual; perennial	15-30	½-2½	Moderate	High	High	Pea aphids, tarnished plant bugs, two-spotted spider mites	Standard options include common vetch, hairy vetch and purple vetch; may be weedy or invasive in some areas

Relative Value of Cover Crop Species to Bees and Other Beneficial Insects cont.

Cover Crop	Life Cycle	Seeding Rate (pounds/acre single species)	Seeding Depth (inches)	Honey Bee Value	Wild Bee Value	Beneficial Insect Value (predators and parasitoids)	Alternative Host of Crop Pests	Notes
FORBS/BROADLEAVES								
Beet	Biennial	6-10	1	Low	Low	Low	Unknown	Wind-pollinated flowers are only marginally attractive to bees
Buckwheat	Annual	30-80	1	High	High	High	Tarnished plant bugs	Top honey plant with nectar flow typically occurring in the morning; shallow flowers attract parasitoid wasps
Canola	Annual	3-10	½	High	High	High	Flea beetles	Excellent honey plant
Chicory	Perennial	3-5	½	Low	Low	Low	Unknown	Flowers are considered self-fertile and attract few insects
Flax	Annual	25-50	¾-1½	Moderate	Moderate	Moderate	Unknown	Reports of bee attractiveness vary; probably most valuable to pollinators as part of a diverse mix
Kale	Biennial	3-10	½	High	High	High	Cabbage loopers, flea beetles, cabbage aphids	Aphid-susceptible varieties likely support the more predatory insects such as lady beetles and lacewings; rapid-blooming varieties most beneficial to bees
Mustard, tame	Annual	5-20	½	High	High	High	Flea beetles	Can be weedy and invasive in California
Phacelia	Annual	5-15	Surface	High	High	High	Tarnished plant bugs	Major honey bee nectar plant; produces volunteer seedlings in moderate climates
Radish	Biennial	8-20	¼	High	High	High	Club root of brassicas, flea beetles, cabbage aphids, root maggots	Deep-rooted varieties are promoted for reducing compaction and adding soil organic matter; not tolerant of prolonged freezing
Safflower	Annual	25-35	1	Moderate	Moderate	Moderate	Sunflower head moths, tarnished plant bugs, wireworms	Relatively drought tolerant with surprisingly deep tap roots (in some cases exceeding 8 feet)
Sunflower	Annual	4-6	½	High	High	High	Sunflower head moths, various beetles, tarnished plant bugs	Both flowers and extra-floral nectaries attract huge numbers of pollinators and beneficial insects, in most cases outweighing any risk of attracting pests
Turnip	Biennial	2-12	½	High	High	High	Club root of brassicas, flea beetles, cabbage aphids, wireworms, cabbage loopers	Turnips tend to be more cold tolerant than radishes, allowing them to flower in the spring unless terminated