

Common Name	Scientific Name	Base Temp	Biofix	Generations	Degree Day or Development Events	Phenology/Calendar	M - J - J - A - S	Early Actions	Plants affected	Trap Crop	Mechanical, Physical, & Material	Biological	Cultural	Chemical	Threshold	Technique	Companion plants for IPM	
Aphids	Various	n/a	n/a	Many	n/a	Most aphids thrive on new plant growth, usually under leaves from mid-June through the end of August before plants senesce.		Maintain vigilance against aphids throughout the growing season.	Scout for aphids. Crouch on sight. Use insecticidal soap liberally when aphids are present.	Over 300 colonies (green peach aphid)	There may be some use for early planting of crop crops that can be used to attract and suppress aphid populations. 1. The growing area that is sprayed with insecticidal soap.	1. For small gardens, aphids can be crushed.	2. It is important to conserve native parasitic wasps in the area that will build up over the growing season and suppress aphid populations. 3. Use green lancing leaver or parasitic wasps instead of synthetic pesticides.	DO NOT fertilize! Nitrogen feeds plants green, but aphids graze on new plant growth.	1. Aphids, being soft-bodied, will respond to insecticidal soaps.	1. For young plants, if 5% of plants have more than 2 aphids, spot treatment is recommended. 2) For mature plants, if 5% of plants have more than 6-12 aphids, global treatment is recommended.	3. If using insecticidal soap, it is recommended to leave the soap on for at least 10 minutes. This will allow the soap to degrade the aphid's outer cuticle. 2. Insecticidal soaps with neem oil may provide more effective than plain insecticidal soap.	Plants with various scents of flowers, such as all, galbanol, and yarrowed and support populations of aphid predators and parasitic wasps that will also feed and paralyze aphids of your crop plants.
Apple maggot	Rhagoletis pomonella	50	3 Jan	1	1st adult emergence 900 DD; 1st egg by 1300 DD. Peak fly emergence 1800 DD. Peak egg by 1750 DD. End of fly emergence 2800 DD.	All stages of the apple maggot will be delayed under dry conditions.	Adult Egg Larva Pupae	1. Set red sphere traps by July 1. 2. Spray baits after fruitfall.	Hawthorn, plum, pear, crabapple, cherry	In late June/early July, place red spheres traps and/or grocery store apples baited with commercial lures and baited with ethanol for aphid reduction.	1. Bag apples after fruitfall. 2. Remove branches after fruitfall. 3. Trap to reduce adults. 4. Remove damaged or rotten apples.	Apply beneficial nematodes to the soil in fall to reduce larvae. Try Steinernema carpocapsae and/or Heterorhabditis bacteriophora.	Remove fallen infested apples from the ground during the growing season.	Apply botanical pesticides approved for food crop use only if adult pest pressure is above threshold.	Five adults flies per trap or 15 flies per planting	Place sticky traps every 10-15 feet depending on the level of control desired or numbers of adults observed.		
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Bean Leaf Beetle	Cerastoma fuscatus	46	Soybean emergence	2	1st Gen adults emerge 1212 DD after soybean first emergence	Adults emerge in May and feed through June.		Monitor for damage early in season, especially when plants have best sets of four leaves.	Cucurbits (cucumber, cantaloupe, squash, pumpkin, melons, watermelon)	Plant soybeans around perimeter and spray with bio pesticide such as sabdella	Place buckets of soap water order plants so that B.L. adults will drown when they fall.	Tachinid flies, Braconia braconia, parasitic wasps, and nematodes	Plant late in season to ensure BLB adults laying eggs in early season. Snap beans can be planted in mid-July.		1-2.5 adult beetles per every 10 plant			
Cabbag e Butterfly or Imported Cabbageworm	Pieris rapae ericae-group rapae	50	3 Jan	5-5 overlapping	Adults emerge at 150-240 DD.	400-800*		1. Place yellow sticky traps in growing area in mid-May. 2. When adults are trapped, spray kaolin clay to prevent eggs.	cabbage, cauliflower, broccoli, kale, rutabaga, radishes, turnips, collards, romanesco, and other crucifers.	1. Plant perimeter of crop crops with Pappus to reduce adults.	1. Row covers. 2. Yellow sticky traps. 3. Netter feeders	1. Trichogramma spp. for eggs. 2. Bacillus thuringiensis (for larvae). 3. Control cabbage for 4th instar larvae. 4. Phenacoria pumilio for chrysalis	1. Mount cut ground healthy thoraxes to encourage "adventurous" roths from the stems. 2. Avoid using insecticides whenever possible to conserve wild predators.	1. Sprayed (Diflubenzuron) for larval control. 2. Bacillus thuringiensis bio-pesticide applications for larval control.	2. Trenching to expose 20% of plants infested with 1 or more of any larval stages (EW). 2. Digging to harvest 100% plants infested with 1 or more of any larval stages.			
Cabbage flea beetle	Phyllotreta cruciferae	50	3 Jan	2 or 3 per year	Adults emerge approximately 150-200 DD.	Early June		2. Yellow sticky cards by June 1. 3. Neem application or dandelion/worm-free by June 1. 3. Row covers in June by June 1.	Plant radish, Chinese giant radish, greens leaf radish, and turnips, treat w/ Pappus to decrease root damage and 2nd generation larvae.	1. Vacuum adults off plants. 2. Row covers by June 1.		1. Plants mulched with 3-4" of straw mulch appear to suffer less damage. 2. Plant late crops in July after adults have mostly departed.	1. Apply kaolin clay to interfere with pests' ability to identify plants and deter feeding.	2-5 adult beetles on one plant. 2-5% plants with "bullet hole feeding damage."				
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Cabbage muggwort ¹⁶	Delia radicum	43 F	3 Jan	2 or 3, depending but 1st generation is the most destructive.	1st adult emergence - 200/300 DD 2nd adult emergence - 1470/1410 DD 3rd adult emergence - 2050/2022 DD	When flies are in bloom or sometimes between May 10 and May 11	M - Adults emerge, in - Egg laying, larval feeding, in - Larval feeding, egg laying, pupation, A -	M - Yellow sticky cards, material at base of plants to prevent egg laying, in - Scout for egg masses, A - Scout for larvae & egg masses, A - Yellow sticky cards. Scout for larvae and egg masses, 1-10	Cruciferous crops, including mustard, cabbage, rutabaga, radishes, cauliflower and broccoli. Polish celeriac is more susceptible than Argentine celeriac ¹⁷									
Cherry Check bugs	Elymus leucophaea fortis	n/a	n/a	Several in southern states; 2 in northern states	n/a	Mid June to July		Check for check bugs in mid-June to late June using the "Tuffies can method"	Grass, corn, sorghum	pending	pending	pending	pending	pending	pending	pending	pending	
Colorado potato beetle ^{18, 19}	Lepidodermis decolorata	50-52 (F)	When eggs are scattered	2 usually in central MT	1st instar 185 DD, 2nd 240 DD, 3rd 300 DD, 4th 400 DD, Pupae 575 DD	Adults emerge during the month of May, and possibly into June.	M - Adults emerge, in - Egg laying, larval feeding, in - Larval feeding, pupation, A - Egg laying, larval feeding, pupation, A -	M - Yellow sticky cards, in - Scout for egg masses, 8 Scout for larvae & egg masses, 6 Yellow sticky cards. Scout for larvae and egg masses, 1-10	Potato	Single row of early season potatoes as a trap crop may help reduce Colorado potato beetle populations. 1. The trap crop is likely to be heavily infested with adults, but probably sufficient to cause alarm.	Vaccuum, Crushing eggs, Tilling the soil to expose soil dwelling eggs and pupae.	1. Colletes maculosa (beetle) eggs and pupae. 2. Beauveria bassiana (fungus) for pupae.	1. 6-10 cm straw mulch application. 2. Late or early planting.	This beetle species has developed a resistance to most synthetic chemical pesticides.	1-5 egg masses per 10 plants. 2. 10% of plants have 2+ adult beetles on them.			
Onion Maggot	Hydrotaea pluvialis	40	3 Jan	3	1st generation adults emerge 680-700; 2nd generation adults emerge 1050-1060; 3rd generation adults emerge 1210-1240 DD; 1st, 2nd, 3rd, and 4th generation flies	Overwintering adults emerge in early to mid-May		1. Yellow sticky cards setup by May 15	Onions, garlic		1. Yellow sticky cards; 2.				2-5% damage and 10 adults in each trap per day			
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Squash leafminer	Pegomya hyoscyami	n/a	n/a	3-5 per year		Late April/Early May	Pupa Early Egg Larvae Pupa Adult Egg Larvae Pupa Adult Egg Larvae Pupa Adult Egg Larvae Pupa Adult	1. Yellow sticky cards in late April/Early May. 2. Scout white egg clusters at night. 3. Cover plants in early May so that adults cannot lay eggs.	Squash, bent, sugar bean, Swiss chard and many weeds including lamb's-quarters, chickweed and nightshade	1. Plant early perimeter crop around growing area and spray with Pappus to reduce egg laying adults.	1. Handpick and destroy second leaves.	Parasitic wasps in the genus Diaploche						
Squash bug ¹⁷	Anasa tristis	n/a	n/a	Scout for nymphs 7-14 days after clearing first adults and egg masses.	1 per year, but all stages can be seen in field.			Apply sabdella, rhyssalis, rotenone during nymphal stage					1. Use resistant varieties such as Butterball, Royal Crown, Sweet Cheese. 2. Encourage habitat for Tachinid fly Phytomyza pennsylvanica or Spalangia such as Comptosia sp. 3. First season: Remove debris around plants that adults may use to overwinter.			During season: Lay boards or shingles under plants to attract aggregations of squash bugs. Destroy them in the morning.		
Squash vine borer	Melittia cucurbitaria	50	3 Jan	1 Generation	Adults emerge 950-1000 DD, 1000-1020 DD.	Adults DOH usually emerge in late June or early July	In - Adults emerge, mate, lay eggs, in - Eggs hatch, larvae feeding, hatching, A - Larvae eat away the soil and pupae until next spring	1. Yellow sticky cards in late June. 2	Many varieties of string vegetables: squash, pumpkin	2. Plant perimeter around protected crop area to reduce adult egg laying. Remove plants before July to reduce severe numbers that pupate in the fall.	Row covers, net covers	1. B.R. or beneficial nematode Steinernema carpocapsae can be applied to the soil to kill borer inside the vine.	1. Prevent egg lay by wrapping aluminum foil around vines. 2. Use floating row cover by June 20. 3. Butterball and cushaw are resistant; yellow crookneck has susceptibility than crookneck. 4.	1. Spray lower stems with Pappus or spinosad to reduce larvae. 2.				
Striped cucumber beetle	Acalymma vittatum	n/a	1st emergence of adults in a field	1 Generation, usually	1. Adults emerge in mid-May. 2. Adult lay eggs 8-20 days after hatching. 3. Eggs hatch 5-10 days after being laid. 4. Larvae destroy between 30-50 % of Pappus	Adults do not fly until average daily temps reach 65 F	Adult Egg Larva Pupae	1. Row covers in mid-May. 2. Trest trap crops with Pappus by mid to late May. 3)	Cucurbits, including squash	Strong preference for Blue Hubbard squash. Plant traps along edges. Remove or treat trap plants after June 1.	1. Cover seedlings to prevent adults from accessing them. 2) Bag vacuums		Deluge planting may reduce the number of crop plants that are exposed to egg laying adults.	The use of yellow sticky traps baited with phenolacetone is recommended.	When leaves approach 20-25% defoliation, treatment is recommended		Natural predators include soldier beetles, tachinid flies, braconid wasps and certain nematodes. Asclepias or collards can be good plant to attract these beneficial insect predators. Buckwheat said to attract and paralyze wasps.	
Whiteflies	Greenhouse whiteflies		When adults are scouted	Many			Egg Nymph Pupa Adult	1. Yellow sticky cards for monitoring.	Many - wide host range			Dacnusa formosa parasitic wasps	1. Insecticidal soaps. 2. Horticultural oils. 3. Chemosensory earth sprays? 4. Neem oil. 5. Pappus	1. Use threshold. If 5% of plants have 1 or more adult whitefly, treatment is recommended.	1. Spray the underside of leaves.			
Whiteflies	Silverleaf whiteflies		When adults are scouted	Many			Egg Nymph Pupa Adult	1. Yellow sticky cards for monitoring.	Many - wide host range			Dermococcus erimaeus parasitic wasps	1. Insecticidal soaps. 2. Horticultural oils. 3. Chemosensory earth sprays? 4. Neem oil. 5. Pappus	1. Use threshold. If 5% of plants have 1 or more adult whitefly, treatment is recommended.	1. Spray the underside of leaves.			
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