

2020
MISSOULA
COUNTY PEST
MANAGEMENT
CALENDAR



PEST MANAGEMENT CALENDAR

INTEGRATED PEST MANAGEMENT

(IPM) strives to optimize plant health by:

- Managing garden and landscape soils for good drainage and aeration
- Building soil by adding organic matter and properly timed fertilizers
- Pruning and irrigating according to the needs of particular plants
- Knowing the plant's level of susceptibility to pest damage
-

IPM also means knowing as much about each pest as possible

- When is the pest MOST vulnerable, infective, or invasive?
- When is the pest most vulnerable to least-toxic management strategies?
- What is the least-toxic management tool that can be used successfully?

The WEEKLY CALENDAR shares an "ever-expanding data base" on when to expect particular pests in Missoula County. The bottom half of this calendar includes weekly life cycle events of common events of common Missoula plants and pests.

NOTE: *Life cycle events, such as when certain plants bloom, may let us know when to expect a pest in our gardens and landscapes.*



**PEST ALERT
PHONE LINE
258-3820**

24 HOURS A DAY—7 DAYS A WEEK

A simple phone call will tell you which pests we are seeing in Missoula at the present time, and what the *predicted* pest outbreaks will be, based on weather dependent models.

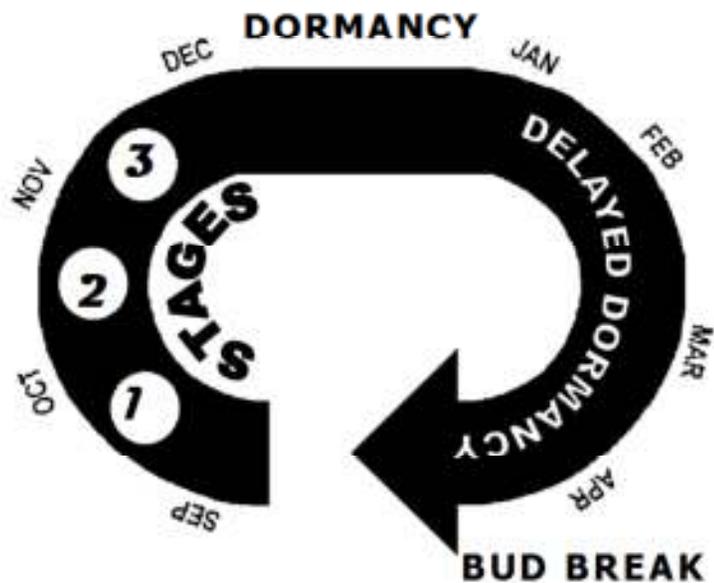
The MONTHLY CALENDAR:

- Summarizes several pests and diseases common to each month
- Lists **LEAST-TOXIC** treatments (those that have the smallest impact on humans, pests, wildlife and insects, like bees and ladybugs, which benefit the garden)
- Lists **HARD PESTICIDE** treatments (those that have greater impact on humans and the environment)

Use the Index at the
Back of this calendar to
easily locate pest and
plant problems by month

Missoula
County Extension
2825 Santa Fe Court
Missoula, MT 406-258-4213

PLANT ACCLIMATION STAGES



- STAGE 1: Short days / Warm temperatures • Leaf color change
- STAGE 2: Cool temperatures 30°F. to 43°F. • Leaf drop starts
- STAGE 3: Cold temperatures <30° F. • Leaf drop complete

DORMANCY: Plants are able to withstand coldest temperature based on the zone in which they are genetically adapted.

DELAYED DORMANCY PERIOD: February • March • April
Warmer temperatures >45°F. and longer days send "wake up" message to plants

LATE DELAYED DORMANCY: April to May Temperatures >55°F. cause bud break and first green leaf tissue appears

Dormant



Delayed Dormant



PRUNING

Prune Zone 4 and hardier plants any time after they have reached dormancy.

Some Zone 4 plants, such as fruit trees and less hardy plants, should not be pruned until the delayed or late delayed dormancy period.

**CHECK
PEST ALERT PHONE LINE
258-3820**

DISEASE PREVENTION

If fireblight or fungal diseases existed the previous summer, consider a late delayed dormant disease preventative spray as buds start to break and day temperatures are 55°F. to 65°F.

- Copper for bacterial and fungal pathogens (or)
- Neem oil for fungal diseases.

INSECT PREVENTION

If mites, aphids, scale and some leaf rollers have caused problems in the past, consider a delayed-dormant horticultural oil application (suffocates pests.) Use when temperatures are >40°F. and <65°F. Most spray oils are petroleum based but mineral and neem oils are available.. Spray oils used during the growing season (and sometimes in the late delayed-dormant period) may injure certain beneficial predator insects and burn tender leaves.

APRIL

PESTS AND DISEASES	LEAST TOXIC TREATMENT	HARD PESTICIDE TREATMENT
<p>Leafroller Larvae (1/4"-1/2")</p>  <p>Tent Caterpillars (1")</p> 	<p>Treat with Bt-Kurstaki(Bt-K) and/or a delayed-dormant oil spray. <i>Bt Spray tips:</i> Mix with 1-2 Tbsp. per gallon of insecticidal soap to help Bt stick to leaves. Add 1 Tbsp. molasses (or other feeding attractant) per gallon, to get pests to eat. Spray in the evening because Bt breaks down rapidly in sunlight. Use when temperatures >45 F. Most effective on young larvae <math>< \frac{3}{4}</math>" long. Spinosad also effective</p>	<p style="text-align: center;">Not usually necessary</p>
<p>Engraver Beetles Red-wine colored 1/4 -3/8" long</p> 	<p>Healthy, well watered, uncrowded trees resist beetle attack. Remove or burn downed tree tops, branches and limbs >3" in diameter before early May.</p>	<p style="text-align: center;">Not usually necessary</p>
<p>Pine Needle Scale Crawlers hatch from underneath linear clusters of elongated, flat white scales on last years needles. Treat only the reddish-orange tiny crawlers</p>	<p>Treat crawler stage with Insecticidal Soap or Oil sprays if >5 to 10 per shoot are seen. Excessive nitrogen and water stress increases scale problems. Crawler stage coincides with bridal wreath spirea blooming!</p>	<p style="text-align: center;">Acephate, Cyfluthrin, Imidacloprid</p>
<p>Petiole Gall Aphids Found on Cottonwoods and poplars, the feeding of the aphid on the petiole (stalk of the leaf), causes the leaf to develop a marble-like gall</p>	<p>May not be necessary--- causes little injury to plants. Spray with Horticultural oil or Insecticidal Soap as buds start to break if you have had a large population in the past.</p>	<p style="text-align: center;">Not usually necessary</p>
<p>White Pine Weevil Wilting, dieback of spruce tops (terminals)</p> 	<p>Disturb over-wintering adults by raking up needles beneath spruce trees in early spring. Remove and destroy wilting terminal branches as soon as they occur.</p>	<p>Spray <u>only</u> tops of trees with Permethrin or Cyfluthrin when buds start to elongate. Imidacloprid soil drench in fall.</p>
<p>Ash Leaf Curl Aphid Green Ash leaves become curled and distorted Green Aphid—See May</p>	<p>Horticultural oil or Insecticidal soap, plus Neem or Pyrethrin when first green tissue emerges in spring (<i>not effective once leaves curl</i>).</p>	<p>If severe problem yearly, use a soil drench in late fall/early spring before bud break with Imidacloprid.</p>
<p>Blister/Rust Mites</p>	<p>Treat with Horticultural Oil as the first buds break in the spring. If mite feeding has been heavy(>50% of leaves damaged), you might consider a second horticultural oil or insecticidal soap application when the first leaves begin to expand.</p>	<p style="text-align: center;">Not usually necessary</p>

April 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Pruning "Last Call" for spring! Remove winter-injured branches now. Check for diseased or insect infested branches, especially those with severe scale infestation. Prune out fireblight -infested limbs on a DRY, SUNNY day.			1	2	3	4
				When apple buds show 1 st green tips, Engraver beetle adults start to lay eggs in Pine trees. LOOK FOR sawdust at the <u>base</u> of trees.		
5	6	7	8	9	10	11
If dandelions or broadleaf annual weeds were a problem last year, check for <i>germinating weed seedlings</i> when soil temps are >45°F. When weeds are young and tender, they can be sprayed with non-selective herbicides such as acetic acid (vinegar) or certain oils.				When Honey Locust trees start to break bud, treat for the Podgall Midge that causes seed-like galls on leaves. Treat Rust and Blister Mites on Mountain Ash and fruit trees and Petiole-Gall Aphids on Cottonwoods with insecticidal soap or oil spray when first leaves emerge.		
12	13	14	15	16	17	18
When Apple trees are showing $\frac{1}{4}$ inch to $\frac{1}{2}$ inch of green leaves and dandelions bloom, CHECK your trees for the first masses of $\frac{1}{4}$ inch to $\frac{1}{2}$ inch Tent Caterpillars .			Ash Leaf-curl aphids emerge when green ash leaves begin to expand. TREAT NOW. . . When leaves curl, it's too late!		When Boxelder leaves expand, check for the green worm " Boxelder Leafroller ." TREAT if >5 live $\frac{1}{4}$ -to- $\frac{1}{2}$ " larvae are found in a 10-branch sample.	
19	20	21	22	23	24	25
When apples are at pink flower bud stage, check fruit trees, shrubs, and green ash for aphids.		Small ($\frac{1}{4}$ inch long) yellow-green beetles with a dark stripe are Elm Leaf Beetles . NO need to treat!			When Poplar leaves begin to expand, look for Petiole-gall aphids Treat for this pest NOW!	
26	27	28	29	30		
White Pine Weevils begin to feed on spruce and pine top branches. Eggs laid now will hatch into white worm-like grubs that cause tree tops to wilt and die. TREAT NOW.		Check for orange, tiny pine-needle scale crawlers hatching underneath white scales on last year's pine needles. If white scales have small holes in them, crawlers WILL NOT emerge from parasitized scales.			BE ALERT to weather that promotes disease infection: >55°F. and wet. Check Pest Alert Phone Line @ 258-3820	

MAY

PESTS AND DISEASES	LEAST TOXIC TREATMENT	HARD PESTICIDE
<p>Fungal Leafspot and Twig Blight on aspen, apricots and Apple Scab on fruit trees</p> <p>Black-Knot on cherry</p>	<p>Spray with a fungicide such as Sulfur, to protect against leaf spots or black-knot galls that show up later in the summer. Keep irrigation water off leaves.</p>	<p>Spray with Captan or Chlorothalonil if prolonged wet and warm periods occur. Apricot Scab can be treated with Captan.</p>
<p>Leafspots on Rose and Phlox.</p>	<p>Use anti-transpirants (Wiltproof or VaporGuard), Baking Soda (Remedy or Milstop), or Sulfur. Must be used preventively, before spots appear.</p>	<p>Immunox, Chlorothalonil</p>
<p>Rust (fungal) disease on Rose, Hollyhock, Hawthorn, & Apple. Powdery Mildew on crabapple.</p>	<p>Keep leaves dry-remove and destroy infected leaves. Spray Sulfur if leaves are wet >4 hours.</p>	<p>Immunox, Chlorothalonil, Halt</p>
<p>Fireblight—bacterium that causes young blossom's, shoots, and fruit to wilt and collapse, turning brown to black.</p>	<p>Prune out infected shoots or limbs 6-18" below injured area on a hot dry day. Sterilize tools between each cut!</p>	<p>Spray with Streptomycin Sulfate during bloom or with Copper after bloom.</p>
<p>Green Aphids</p> <p>Spruce Gall Adelgid—look for wooly clumps at the base of buds on Doug. Firs & Spruce</p> <p>Leafhoppers—Virginia Creeper, Rose, Grapes and Potato, look for white stippling on leaf surfaces.</p>	<p>APHIDS -lacewings or ladybug release. Insecticidal soap + Neem or Pyrethrin.</p> <p>ADELGIDS- SPRAY WITH Insecticidal soap, or soap + Neem, repeat applications may be required.</p> <p>LEAFHOPPERS—Pyrethrin + Insecticidal soap</p>	<p>Spray with Acephate or Malathion for high numbers of aphids or leafhoppers, or if plants are susceptible to aphid injury (leaf curling). Acephate is not labeled for use on food crops. Imidacloprid used as a systemic drench for Spruce Gall Adelgid.</p>
<p>Birch Leafminer Lilac Leafminer</p> <p>Only treat whitish larva inside birch/lilac leaves, causing pale blotches which turn brown and papery.</p>	<p>Use a soil drench or spray with Neem or spray Spinosad.</p>	<p>Using a systemic insecticide such as Acephate or Imidacloprid when 1st leafminer larva is seen. Soil drenches with Imidacloprid in late fall/early spring are effective also.</p>
<p>Spruce Budworm 1 inch long, brownish caterpillars with ivory spots. Older larvae tie tips of shoots together to form a nest.</p>	<p>Spray swelling buds of trees with Bacillus Thuringensis Kt mixed with 1-2 Tbsp/gallon of Insecticidal Soap or spray Spinosad.</p>	<p>Spray with Carbaryl or Cyfluthrin if this pest has killed terminals in previous years.</p>
<p>Western Raspberry Fruitworm</p> <p>Light brown beetles usually found on leaves and buds in spring. White, worm-like grubs in fruit later in summer.</p>	<p>Treat only the brown beetles that slit new leaves, with Spinosad. Till soil around plants in late summer after harvest.</p>	<p>Spray Carbaryl pre-bloom</p>
<p>Grasshoppers</p>	<p>Nosema locustae (Semaspore)</p>	<p>Carbaryl bait</p>
<p>Leafroller Larvae (see April)</p>		
<p>Turf—Sod Webworms and Cutworms</p>	<p>Spinosad, Beneficial Nematodes</p>	<p>Bifenthrin, Cyfluthrin, Imidacloprid</p>

May 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<p>If days are warm (60°F. to 80°F.) and nights are >50°F. and humid, Powdery Mildew infection occurs on flower and crabapple terminals.</p> <p>√ PEST ALERT LINE @ 258-3820</p>		<p>When soil temperatures are > 50°F., it's time to fertilize lawns. Use a 1:1:1 N-P-K ratio fertilizer. Aerate lawns now if dandelions are NOT blooming.</p>		<p>Some lawn fertilizers contain weed¹ killers. If weeds are not a problem, you <u>may not need</u> the added herbicide. Compost, approximately ½" to 1" deep, is a good 1:1:1 fertilizer.</p>		<p>Some lawn fertilizers contain weed² killers. If weeds are not a problem, you <u>may not need</u> the added herbicide. Compost, approximately ½" to 1" deep, is a good 1:1:1 fertilizer.</p>
<p>3 When Plums <u>finish</u> and Apples <u>start</u> to bloom, check for Leafroller larvae on newly expanded fruit tree leaves. TREAT if you find >3 green or white 1/8 inch to 1/2 inch long worms in a 10-branch sample.</p>	<p>4</p>	<p>5</p>	<p>6 When lilacs show purple flower clusters, LOOK for aphids on aphid-susceptible trees and shrubs such as ornamental and fruiting Plum, Caragana, and Spirea. White, fluffy aphids at the base of new buds on Douglas Fir and Spruce are the Spruce Gall adelgids that cause pine cone-like galls later. Treat if 50% of branch tips are infested.</p>	<p>7</p>	<p>8</p>	<p>9</p>
<p>10 The "blossom stage" of Fireblight disease occurs in warm, wet weather when apples and pears are blooming.</p> <p>Put up Codling Moth traps in apple trees</p>	<p>11</p>	<p>12 Orange gelatinous "growths" on Junipers are spores of the Rust disease that cause orange spots on leaves of Hawthorn and Apple later in the season. Protect new Apple and Hawthorn leaves now.</p>	<p>13</p>	<p>14</p>	<p>15 Fungal leafspot or Rust disease infects new aspen, rose, hollyhock, and strawberry leaves in wet weather; spots are seen later.</p>	<p>16</p>
<p>17 Week of last frost (average!!) in Missoula</p>	<p>18</p>	<p>19 Check <u>undersides</u> of Virginia Creeper leaves for pale, white leafhopper nymphs. TREAT <u>before</u> nymphs turn into flying adults.</p>	<p>20</p>	<p>21 When birch leaves are expanding and crabapple and apple trees are in full-bloom to petal fall look for birch leafminer larvae inside leaves. See May & June for treatment.</p>	<p>22</p>	<p>23</p>
<p>24 Black-knot disease infects chokecherry and plum when weather is wet for >6 hours and temperatures are 55° F. to 77°F.</p>	<p>25</p>	<p>26</p>	<p>27 Brown spots in lawn, grass blades chewed off at soil level could be cutworms or webworms.</p>	<p>28</p>	<p>29 Look for oyster shell scale egg hatch on lilac, aspen, cotoneaster and willow. TREAT with Insecticidal Soap or Oil</p>	<p>30</p>
<p>31</p>	<p>When lilacs bloom and spruce buds are elongating, look for the greenish-brown ½ inch to 1½ inch spruce budworms. TREAT now.</p>			<p>When raspberries are just about to bloom, treat for adult Western Raspberry fruitworm. When White Clover blooms, apply "Semaspore" to grassy, south-facing areas where GRASSHOPPERS are hatching. Semaspore takes 6 to 8 weeks to work</p>		

JUNE

PESTS AND DISEASES	LEAST TOXIC TREATMENT	HARD PESTICIDE TREATMENT
Bronze Birch Borer Beetle larvae tunnels under bark and girdles branches eventually killing the portion above tunneling	Adults usually lay eggs in stressed or injured trees. Deep water weekly during hot, dry weather to prevent attack. Plant resistant varieties.	Apply Carbaryl to trunk and lower limbs in late spring or soil drenches of Imidacloprid in late fall.
Cottonwood Leaf Beetle and Elm Leaf Beetle Most of the damage is done by the larva, and results in skeletonizing of leaves.	Spray at larval stage with Neem if >50% of leaves are infested.	Spray Cyfluthrin , Acephate , Bifenthrin , or Imidacloprid can be used as a soil drench in late fall/early spring.
Mountain Pine Beetle White $\frac{1}{4}$ " grubs with dark heads feed under the bark of pines. They become adults in late June and July and move to healthy new trees over 5" in diameter to lay eggs.	Maintain pH < 6.5 and thin crowded trees. Mulch roots lightly (<2" deep). Keep trees well watered in July and August. Verbenone Pine Beetle repellent packets applied at the end of June to trees.	Spray trunks up to 5" diameter, with Carbaryl (Sevin SL or XLR) spray; or hire a professional to apply a high pressure spray. Carbaryl provides control for up to 2 years.
Codling Moth The caterpillar larvae enters into the flesh of apples and feeds inside the fruit. Look for entry and exit holes.	Spray in the evening with Pyrethrin or Spinosad . Add molasses and insecticidal soap to mixture (1 Tbsp. per gallon). 2–3 generations per season.	Spray with Malathion , Carbaryl , or Permethrin as recommended by the Pest Alert Hotline 258-3820 .
Rust/Blister Mites are microscopic and cause leaf or fruit surfaces to turn brown or rusty.	Treatment may not be necessary—causes little injury to plants. (see April)	
Shot Hole Disease (Coryneum Blight) On leaves as small reddish spots that enlarge and become purple with a white center. These spots then drop out of the leaf, leaving a "shot hole" appearance.	If weather is wet and temperatures are >60° F., protect newly expanded leaves with Sulfur . (On Apricots use Captan) Keep irrigation water off leaves.	Protect newly expanded leaves with Chlorothalonil or Immunox .
Flea Beetles Beetles emerge early in the spring and begin feeding on plants and weeds as soon as daytime temperatures consistently reach 40° F.	Sticky traps (white/yellow sticky card) encircling susceptible planting reportedly catch large numbers of beetles, but will not control a large population. Neem or Pyrethrin sprays. Keep plants well fertilized to help plants outgrow damage.	Carbaryl dust—DO NOT apply to plants in flower to avoid harming bees.
Poplar Borer Adults are $1\frac{1}{4}$ " gray beetles that have an extended life cycle that likely requires 3 years to complete. Adult beetles may be present from mid-June through early fall. After mating, females chews pits in the bark and inserts eggs.	Keep trees well watered, removing infested trees, and letting suckers grow to form new trees.	Apply Carbaryl or Cyfluthrin to the trunk in July when Adults are active. Application should focus on area of attack in the middle of the tree where egg laying is concentrated.

June 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 If you have had wormy cherries , purchase yellow card or red ball sticky traps; hang them in cherry trees NOW .	2 Apricot and Apple scab infection possible if weather is wet. Check Pest Alert Phone Line: 258-3820	3	4 When Apple fruit is $\frac{3}{4}$ inch in size, expect first generation of Codling Moth larva. Check Pest Alert Phone Line (258-3820)	5	6
7 When dandelions have finished seeding, AERATE lawn (if not done yet) to help it grow stronger roots and resist weeds.	8	9 Time to apply preventative Mountain Pine Beetle and Bronze Birch Borer preventative sprays.	10	11 When lilacs finish bloom and mock orange is blooming, look for the first $\frac{1}{8}$ inch to $\frac{1}{4}$ inch black worm-like Elm Leaf Beetle larva. Treat after checking Pest Alert Phone Line (258-3820).	12	13
14 When cherries are starting to change color, Western Cherry fruit fly adults migrate to cherry trees. CHECK traps for black, small flies with "Z" or "W" wing pattern. Time to treat now!	15	16 Many insect predators such as Ladybugs, Lacewings, and parasitic wasps are now present --- Be careful NOT to kill these beneficial insects when spraying pesticides	17	18 Leafrollers on fruit trees and boxelders often reach <u>peak feeding</u> when apples are $\frac{1}{4}$ " to $\frac{1}{2}$ " in diameter (see April for control). No control necessary on Boxelder if 20% of leaves are UN-injured. Keep trees well watered.	19	20
21 Raised yellow or brownish spots on Mountain Ash and apple are caused by Rust/Blister Mites .	22	23 Cottonwood leaf-beetle larvae hatch in cottonwood trees. LOOK for first-generation pear slugs on fruit and ornamental trees and on cotoneaster (see September for Pear Slug control).	24	25	26	27 Pine Beetle Repellent Pheromones need to be applied now
28	29 Leafrollers on fruit trees and Box Elder start to pupate when roses and lavender blooms. No need to treat now.	30		Look for blackened, crooked terminal shoots on aspen and poplar. Prune out these fungus-infected shoots (Twig Blight) on a dry, sunny day.		

JULY

PESTS AND DISEASES	LEAST TOXIC TREATMENT	HARD PESTICIDE TREATMENT
<p>Knapweed</p>	<p>Best time to mow is when plants are in full flower before first seeds form.</p>	
<p>Western Cherry Fruit Fly Adults flies have clear wings with black stripes, 1/5 inch in size. Eggs are laid under the skin of fruit. At about the time they start to turn red. Small maggots, or worms, quickly develop from the eggs and feed on cherry flesh.</p>	<p>Trap adults with red ball or yellow card sticky traps. Treat adults with Pyrethrin or Spinosad if >2 flies each week in traps.</p>	<p>Spray with Carbaryl or Malathion if >2 flies in trap per week. Allow a minimum of three days before harvesting. Once cherries are ripe, it's too late to spray.</p>
<p>Spider Mites Various species of tiny red and greenish-white spiders (0.06 inch in length), cause yellowing and browning of plant leaves. They produce webbing when populations are high.</p>	<p>Keep plants well irrigated. Decrease nitrogen fertilizer. Spray with Insecticidal Soap. Repeat applications may be necessary as mites reproduce quickly. Add 1 Tbsp. Sulfur/per gallon to Insecticidal Soap if population isn't decreasing. Neem or Botanical Extracts (Mite-X) also effective.</p>	<p>Acephate or Bifenthrin if populations are high. For commercial applications -Floramite, Talstar, or Vendex. Spray tops and undersides of needles or leaves to get complete coverage. Avoid using Carbaryl as it kills predators and causes mite outbreaks.</p>
<p>Leafhoppers (See May)</p>		
<p>Black Vine Weevil Adults are small dark colored beetles with a snout which feed on leaves at night. Look for ragged notches on edges of leaves. Larva (up to ½") feed on roots.</p>	<p>For controlling larva apply parasitic nematodes or Beauveria Bassiana (Naturalis-O) to soil around base of plants affected and water in immediately. Keep soil moist before and after application. Fall treatment recommended in Montana.</p>	<p>Acephate or Imidacloprid. Begin treatment for adults in late May or June.</p>
<p>Pine-Needle Scale (See April) scales are elongated white bumps. Heavily infested trees may appear flocked. Infested needles turn yellow then brown.</p>	<p>Treat tiny, orange crawler stage only. Crawlers hatch from underneath the white scales on last year's pine needles. Treat with Insecticidal Soap or Oil Spray if >5 to 10 scales per shoot. Excessive nitrogen and water stress increases scale problems.</p>	<p>Acephate, Cyfluthrin, or Imidacloprid. Apply crawler sprays shortly after egg hatch, which can be determined by monitoring (coincides with bridal wreath spirea blooming!). The small rosy-colored crawlers are detected by shaking a branch over a piece of white colored paper.</p>
<p>Hobo Spiders Large brown spiders with chevron marking on abdomens. Males have two large palps which look like boxing gloves, while females have smaller palps.</p>	<p>Controlling hobo spiders calls for such measures such as eliminating suitable habitat around infested areas. But you may be able to reduce the potential entrances by sealing cracks in the foundation, sealing the undersides of doors, screening dryer vents and caulking cracks. Place sticky traps in areas where spiders hang out.</p>	<p>The application of pesticides outside in late June (along foundations) will kill juveniles and adults. Carbaryl, Malathion, or Cyfluthrin are the recommended materials to use. The single most effective deterrent against the hobo spider is competing spider species.</p>



July 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Last week to fertilize (esp. Nitrogen) woody perennial shrubs and trees. Good time to add 2 nd application of lawn fertilizer.			1 When apple fruit is $\frac{1}{2}$ inch in diameter, <i>birch leaf miners</i> are pupating and becoming adults. Do NOT treat	2 Apple, Crabapple, and Aspen leaves may start to develop <i>leaf spot lesions</i> from spring fungal infections if weather was wet in April and May. TOO LATE TO TREAT now unless weather continues to be <u>wet</u> or irrigation water hits leaves. Keep water off leaves!	3	4 to develop <i>leaf</i>
5 New <i>Mountain Pine Beetle</i> attacks begin. Preventative sprays should be on undamaged trees by the first week of June!	6	7 <i>Hobo spiders</i> start to move indoors - seal and/or spray foundation perimeters	8	9	10 Prune out <i>fireblight</i> strikes on a hot, dry day. Sterilize pruners between cuts.	11
12 <i>Aphid</i> populations start to decrease if weather is <u>hot and dry</u> . Aphids with wings develop and move (mostly) from shrubs and trees to flowers and vegetable plants.	13	14	15 Tan-colored moths flying near Boxelder trees are the NON-FEEDING stage of the <i>Boxelder leafroller</i> . NO NEED TO TREAT . Boxelder leafrollers are done for the year!	16	17 <i>Leaf hoppers</i> may be present on underside of leaves with white stippling.	18
19 Linden tree finishes bloom. <i>Spider mites</i> may be feeding on susceptible plants. <u>Check undersides of leaves now.</u>	20	21 TIME TO MANAGE <i>Codling Moth</i> . What product you spray determines how often you spray for control. Check Pest Alert Phone Line (258-3820) for tips.	22	23	24 <i>Cherry fruit fly larvae</i> is usually <i>inside</i> cherries by the middle of July. TOO LATE TO TREAT.	25
26 <i>Black Vine Weevil</i> adults notch leaf margins of landscape plants such as lilac. Treat larva that live in the soil when <i>Spirea vanhoutti</i> is finished blooming.	27	28 Mow seed-producing weeds (like <i>Knapweed</i>) when they are in full flower and before they seed.	29	30 <i>Mourning Cloak Butterfly larvae</i> may be present on Aspen, Willow, Elm and Poplar trees. <i>Usually no need to treat.</i>	31 <i>Elm Leaf Beetle larva</i> begin to drop to the ground and pupate. GOOD TIME TO HAND PICK the yellow pupae.	

AUGUST

PESTS AND DISEASES	LEAST TOXIC TREATMENT	HARD PESTICIDE
<p>Apple Scab Brown to black spots appear on leaves and fruit. Leaves pucker and may fall early.</p> <p>Aspen Leaf Spots Start as small yellow to brown dots and expand to large black spots. Leaves eventually curl and may drop early.</p>	<p>Keep irrigation water off of leaves. In hot, dry weather, don't worry. Rake up and destroy infected leaves as they drop; or, shred leaves with a mower and apply 1-2" layer of compost in late August to speed leaf decomposition. Apply Sulfur spray preventatively.</p>	<p>Usually not necessary. Captan or Immunox may be sprayed preventatively.</p>
<p>Codling Moth Caterpillar makes its way to the core area to feed, then exits—usually through entry tunnel to pupate.</p> 	<p>Pick up fallen infected apples and dispose of. Spray in the evening with Pyrethrin or Spinosad, adding a feeding attractant—1 Tbsp./gal. molasses and 1 Tbsp. insecticidal soap/gal. for increased efficacy.</p>	<p>Spray with Malathion, Carbaryl, or Permethrin as recommended by the PEST ALERT HOTLINE 258-3820</p>
<p>Apple Skeletonizer and Leafroller (See April) Yellowish green $\frac{1}{4}$ inch to $\frac{1}{2}$ inch long caterpillar with parallel rows of black spots along its back.</p>	<p>Spray with Bt-K if >5 live larva are found in a 10—branch sample. (See April)</p>	<p>Usually not necessary. Carbaryl, Bifenthrin, or Pyrethrins are effective.</p>
<p>Elm Leaf Beetle Adult beetles do chew holes in leaves but larvae does the most damage by skeletonizing leaves. Heavily infested trees will turn brown and defoliate prematurely.</p> 	<p>Spray with Neem Extract if more than 75% of leaves show larval feeding damage and larva are still present.</p> 	<p>Since most species are NOT defoliated by this pest, sprays for controls are usually unnecessary. Spray with Cyfluthrin or use Imidacloprid as a soil drench in late fall/early spring.</p>
<p>Spider Mites (See July) Several species of mites cause damage to plants. Most damage appears first as yellowing of leaves due to chlorophyll removal during feeding, followed by bronze appearance.</p>	<p>Spray with Insecticidal Soap. Repeat applications may be necessary on plants you plant to bring indoors where temperatures will continue to be warm.</p>	<p>Not necessary unless leaves are turning brown or heavy webbing in early August. Try and wait to treat overwintering eggs with delayed—dormant horticultural oil next spring.</p>

August 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Brown-cracked spots on apricot fruit are due to <i>Apricot scab</i> (see May)			Apple tree leaves may have velvety-brown <i>apple scab</i> lesions or black blotches. Leaves may drop early but don't worry; usually not damaging to trees. Fruit with sunken, dark spots were infected with <i>apple scab fungus</i> in May/June.	Too late to treat now!		
2 STILL TIME TO MANAGE <i>Codling Moth</i> . Check Pest Alert Phone Line (258-3820) for exact timing.	3	4	5 <i>Leaf scorch</i> symptoms on Maple and other water-loving trees mean you need to water trees and apply 1 inch to 2 inches of composted bark mulch.	6	7 Knapweed in full bloom. Manage weeds before they seed!	8
9 Second generation <i>Leafroller larva</i> and <i>Apple Skeletonizer</i> . Larva start to feed on fruit tree leaves. You may see larva dropping on threads. Treat before larva are >1/2 inch in size if you find more than six live larva in a 10-branch sample.	10	11	12	13 <i>Fall Webworms</i> may be present on Chokecherry and Cottonwoods. Remove and destroy the "nests" or use Bt-K .	14	15
16 <i>Elm leaf beetle</i> adults begin to lay eggs in Elm trees. TOO EARLY TO TREAT	17	18 Aspen leaves may have black spots or black curling leaves that are dropping early, due to Aspen Leaf Spot fungus . Usually not damaging to trees.	19	20	21	22
23 <i>Western raspberry fruitworm</i> (see May): If you had worm-like grubs inside raspberries this season, <u>prune out</u> old canes as soon as they fruit and <u>cultivate</u> around raspberry plants to disturb the ground where these larva drop to pupate and overwinter	24	25	26	27	28 Knapweed seeds already forming - - - too late to mow	29
30 Second generation <i>Elm Leaf beetle</i> larva begin to hatch. TREAT if 75% of Elm leaves are infested with the black worm-like larva.	31	<i>Aphids</i> may be present in shady, moist areas. Insecticidal Soap is usually all that is needed at this time of year. TREAT if you find >4 colonies in a 10-branch sample, or if present on plants you plan to over winter indoors.			SLOWLY start decreasing irrigation on woody shrubs and trees to help them prepare for winter.	

September

PESTS AND DISEASES	LEAST TOXIC TREAT- MENTS	HARD PESTICIDE
Aphids winged and wingless adults	Mark/note plants with Aphids—Spray now or wait until next year and spray with delayed dormant oil spray in early spring. Spray with Insecticidal Soap if <50% of branches are infested and plant is stressed, or if plants will be moved indoors.	Not necessary to spray but you may want to get systemic drench (Imidacloprid) ready to apply in late fall to plants that are consistently affected every spring.
Pear Slugs Green or black sawfly larva which skeletonizes leaves. Young larvae resemble a small slug due to the green slime that covers their body.	Spray with Insecticidal Soap if <50% of leaves have feeding injury. Bt is not effective on pear slugs.	Not necessary
Leaf Spots and Twig Blights	Prune out blighted twigs and branches on hot, dry day. Rake and remove leaves as they fall.	Not necessary

WINTERIZING THE GARDEN

- Prepare plants for winter by slowly decreasing water. DO NOT PRUNE PLANTS UNTIL THEY HAVE GONE DORMANT (refer to Plant Acclimation Stages, page 2).
- Plants that ARE hardy to Zones 3 and 4 can have irrigation again AFTER their leaves have changed color and dropped. Fall irrigation, and an application of PHOSPHORUS-only fertilizer, may encourage a beneficial flush of root growth on woody perennials in Missoula.
- Water landscape plants, especially evergreens, one last time during late fall --- after deciduous leaf drop when plants are dormant and before ground freezes.
- Harden off less-hardy plants (Zone 5) more carefully. Be careful NOT to keep plants growing by watering, fertilizing with nitrogen, or by heavy pruning.
- Protect evergreen plants and roses (esp. climbing roses) from winter wind and bright sunlight with shading, or spray anti-transpirants such as Wiltpruf or Vapor Guard.
- Put containerized plants on their sides in a protected area where temperatures will remain constant; bury containers in sawdust or ground bark. If plants are to overwinter indoors, treat any pest problems before bringing inside!
- Protect the trunks of recently transplanted young trees with light-colored wrapping or white latex paint. This helps decrease bark splitting on bright, sunny winter days following cold nights.
- Mulch plants with compost (up to 2 inches deep), or mulch with straw, hay, composted leaves, or non-diseased brush trimmings after a hard frost. Mulching is especially important for strawberries and roses. Cover roses up to 1 inch above the bud graft union with soil, then add 2 feet of loose mulch, such as pine needles or ground bark.
- Apply a light application of compost to lawns ($\frac{1}{2}$ inch to 1 inch deep) after last mowing of season.

September 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 <i>Aphids, mites, leafhoppers, and rose slugs</i> may be present on roses and susceptible woody plants. Usually NOT a problem this late in the season.	2	3 Cherry trees and cotoneasters may have second-generation <i>pear slugs</i> . No need to treat unless >50% of leaves infested.	4	5 Crabapples infected with <i>apple scab</i> in the spring may drop leaves now. RAKE AND REMOVE!	6	7
8 <i>Elm leaf beetles</i> start to pupate. TOO LATE TO TREAT. Yellow and black beetles may move into homes. No worry as they are <u>not</u> injurious to buildings	9	10 Tiny, winged insects on fruit trees and shade trees (such as Green Ash) are <i>Aphids</i> laying overwintering eggs. IF THEY WERE A PROBLEM THIS SEASON, SPRAY WITH A DORMANT HORTICULTURAL OIL <u>NEXT</u> SPRING. Dormant oil spray in the fall is possible <u>if</u> done early when night temperatures still remain above 30°F. Some pests are better controlled by a <u>spring oil application</u> .	11	12	13	14
15 Let lawns grow longer (>3 inches) and decrease irrigation. When temperatures start to dip below freezing, mow lawns one last time to 1.5 inches to 2 inches. (<i>this helps to avoid snow mold disease if we have a snowy winter</i>)	16	17	18	19	20 Week of (<i>average!</i>) FIRST FROST Protect frost-tolerant plants	21
22 If you begin to see tiny, pine cone-like growths on Spruce branches, these are caused by <i>Spruce gall Adelgids</i> . Treatments are best applied in spring (see May).	23	24	25	26 AFTER THE GROUND FREEZES, mulch roses to where branches begin to spread (6 inches to 8 inches deep.)	27	28
29 Remember to check the PEST ALERT PHONE LINE 258-3820 <i>Nuisance</i> insects, such as Stink Bugs, Box Elder bugs, and Elm beetles may start invading homes. Vacuum/Sweep up! Don't worry---- they do NO danger to/in buildings	30	Garden and Landscape sanitation solves many pest problems so REMOVE diseased or dead, woody and herbaceous material from yard and garden.				

PEST MANAGEMENT CALENDAR INDEX BY PEST & PLANT

Aphids 3,4,5,6,7,11,13,14,15	Fall Webworm 13	Parasitic Wasps 9
Apple 5,6,7,8,9,11,12,13,15	Fireblight 3,5,6,7,11	Pear slugs 9,14,15
Apple Scab 6,9,12,13,15	Grasshopper 6,7	Petiole gall aphids 4,5
Apple Skeletonizer 10,11,12,13	Hawthorn 6,7	Pine 4,5,8,9,10,11
Apricot Scab 6,9,13	Honeylocust 5	Pine needle scale 3,4,5,10
Ash leaf curl aphid 4,5,14,15	Juniper 7	Plum 7
Aspen 6,7,8,9,11,12,13	Knapweed 10,11,13	Pod gall midge 5
Aspen leaf spot 6,7,11,12,13,14	Lawn 6,7,9,11,14,15	Powdery Mildew 6,7
Black Knot 6,7	Leafhopper 6,7,10,11,15	Rose slugs 15
Black vine weevil 10,11	Leafminer, birch 6,7	Rusts 6,7
Birch 6,7,8,9	Leafminer, lilac 6	Rust mites 3,4,5,8,9
Boxelder 5,9	Leaf rollers 3,4,5,6,7,9,12,13	Snow mold 15
Boxelder leaf roller 4,5,9	Leaf spot 4,6,7,11,12,14	Spiders 10,11
Bronze birch borer 8,9	Leaf scorch 13	Spider mites 3,10,11,12,15
Chokecherry 6,7,13	Linden 11	Spruce 6,7,15
Codling moth 7,8,9,12,13	Mites, rust 3,4,5,8,9	Spruce budworm 6,7
Cottonwood leaf beetle 8,9	Mites, spider 3,10,11,12,15	Spruce gall adelgid 6,7,15
Cottoneaster 7,9,15	Mountain ash 5,9	Tent caterpillar 4,5
Elm 5,8,9,11,12,13,15	Mountain pine beetle 8,9,11	Twig blight 6,9,14
Elm Leaf beetle 5,8,9,11,12,13,15	Mourning cloak butterfly 11	Weeds 5,7,11,13
Engraver Beetle 4,5	Oyster shell scale 7	Western cherry fruit fly 9,10,11