

Colorado Coalition for School IPM Newsletter

May 2019

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Colorado Coalition for School IPM Agency Partner Spotlight: Prevent Asthma Triggers

Prevent Asthma Triggers and Other IAQ-Related Issues With Preventive Maintenance!

The [Indoor Air Quality \(IAQ\) Tools for Schools: Preventive Maintenance Guidance](#) can help you plan ahead and prevent IAQ issues—such as the generation of asthma triggers—before they occur. Learn the value of IAQ preventive maintenance from the experiences of champion school districts like North East Independent School District in Texas, whose program works to lower the number of missed school days for students with asthma by reducing asthma triggers.

Browse the [guidance](#) and use the components of IAQ preventive maintenance to help address your school's unique IAQ challenges.



HVAC and Equipment

Monitoring your school's HVAC system using preventive maintenance is like an

The Components of IAQ Preventive Maintenance



HVAC and Equipment



Integrated Pest Management



Mold and Moisture



Source Control



Green Cleaning and Materials Selection



Energy Efficiency

early warning system—doing so will help you find problems before they find you. When your HVAC system is working correctly, your facilities have better air circulation and odor control, as well as a reduced level of pollutants.



Mold and Moisture

The best way to control indoor mold growth is to control moisture. Mold can cause a variety of health problems, increase allergic reactions and cause asthma attacks.

Facility neglect often leads to moisture problems, especially when roofs, plumbing or ventilation systems are not routinely inspected.



Green Cleaning and Materials Selection

Green cleaning products and maintenance practices can increase a school building's life span and cut unexpected costs. They also can be less harmful to student and staff health and IAQ than traditional products and practices.



Integrated Pest Management

Pests can be a major, hard-to-manage problem in schools. Not only can they damage school facilities, they also can cause IAQ and health problems for students and staff. Deferring maintenance of your building can cause it to start deteriorating, which gives pests easy entry points, such as wall cracks, and ideal living situations, such as leaky areas or poorly cleaned spaces.



Source Control

Eliminating or reducing individual pollution sources, such as chemicals, radon, pesticides, emissions, etc., can improve IAQ and student and staff health. Source control is critical for reducing pollutant exposures and expensive accidents.



Energy Efficiency

There is a close connection between IAQ, energy efficiency and preventive maintenance and how they affect the school environment. Poor energy management can create IAQ problems and lead to poor ventilation in occupied spaces. Preventive maintenance plans can include proactive actions to improve energy efficiency while ensuring that IAQ is protected.

Including preventive maintenance as a part of your IAQ management in schools will present new opportunities to elevate your current practices to become more proactive and predictive, achieving better facility performance, extending equipment longevity and avoiding costly repairs. By acting quickly to address IAQ issues as they arise, school districts can save money while protecting the health of students and staff members. Download the guidance and learn more today!

DOWNLOAD

Questions?

EPA offers free IAQ Tools for Schools resources—including the [School IAQ Assessment Mobile App](#)—to help schools maintain a healthy indoor environment by identifying, correcting and preventing IAQ problems. Learn more about the IAQ Tools for Schools guidance and access other valuable school environmental health resources at www.epa.gov/iaq-schools.

CCSIPM School District Spotlight: Creating Asthma Friendly Schools in Colorado

May is National Asthma and Allergy Awareness Month

According to the Asthma and Allergy Foundation of America, more than 26 million people in the United States have asthma, including 7 million children. Asthma is a chronic lung disease that inflames and narrows the airways, causing wheezing, breathlessness, chest tightness and coughing. It affects people of all ages but most often starts in childhood. Tragically, 10 people die from it every day.

Although people with asthma always have the disease, they only experience symptoms or an asthma attack when a trigger irritates their lungs. Severe asthma attacks may require emergency care and can be fatal. There is no known cure for asthma but knowing and avoiding the triggers can help manage it. Asthma is one of the most common chronic diseases in the U.S. and costs our society \$82 billion a year according to the Asthma and Allergy Foundation of America.

The article following this intro, details some of the efforts that are underway in Colorado Schools to make school environments more asthma friendly for students and staff living with asthma.

Creating Asthma Friendly Schools in Colorado: The Colorado Step Up Asthma Program

by Melanie Gleason, MS, PA-C, Manager Colorado Step Up Asthma Program, Children's Hospital Colorado

Donna Shocks, MSN, RN, CNS, Manager Nursing and Student Health Services, Denver Public Schools

The fact that asthma is a significant health issue for nearly one of every 10 children in the United States makes it a major concern in the classroom as well as the clinic. It is the cause of 36,000 school absences each day and has the potential to negatively impact school performance and academic achievement. Moreover, morbidity and mortality rates are disproportionately higher among urban and minority children, many of whom already face educational disadvantages.

Beyond the increased emergency department visits and hospitalizations associated with asthma is the heightened risk of premature death: 185 children die annually from asthma-related complications. The Colorado Step Up Asthma Program led by Children's Hospital Colorado in partnership with

Denver Metro school districts, the Region 8 EPA and other community partners is answering a need to provide a circle of support for children with asthma and thus reduce asthma morbidity and achieve better outcomes.

The Colorado Step Up Asthma Program

The seeds of today's Step-Up program were planted a decade ago when Stanley J. Szeffler, MD, Director of the Pediatric Asthma Research Program at Children's Colorado, partnered with Denver Public Schools (DPS) to identify high-risk students. The program identified schools most severely impacted by asthma with students at risk of health disparity due to race/ethnicity factors and high rates of poverty. DPS is committed to being a full participant, contributor, and driver because of their recognition of the importance of asthma in the school setting. They are committed to the success of all students and know the outcome first hand of poor asthma control. The leadership in the Department of Nursing & Student Health Services, Donna Shocks, RN, MSN, provided immense insight and guidance for addressing school asthma management while adhering to policies and regulations. She established buy-in from key leaders in the district including the superintendent, department of technology, department of risk management and the facility director.

Collaborative effort produced the four-component program now in place:

1. Assessment and monitoring
 - Validated survey tools to monitor asthma control
 - Close monitoring of students with severe asthma by the school nurse
 - Asthma "checkup" visits with an asthma counselor 4-6 times per year
 - Feedback to families and healthcare providers
2. Asthma education and self-management training
 - Open Airways for Schools – grades 3-5
 - Kickin' Asthma – grades 6-8
3. Care coordination
 - Linking access to care
 - Referrals to address social determinants of health
 - Communication among the school nurse, step up team, family and health care provider

4. Support of "asthma-friendly" school environment
 - EPA tools for school – Indoor Air Quality Management Program
 - Tailored approach to eliminating environmental triggers in the home environment
 - Professional development for school nurses through a technical assistance program
 - Asthma education for faculty, staff, and teachers

Improving indoor air quality:

While, case identification, care coordination and standardized school-centered asthma management is critical to the success of the program, the direct benefits through these measures are mainly limited to children with asthma participating in the program. However, through the environmental component of this partnership, the benefits of improved indoor air quality has the potential to reach thousands of students, teachers, staff and visitors each year.

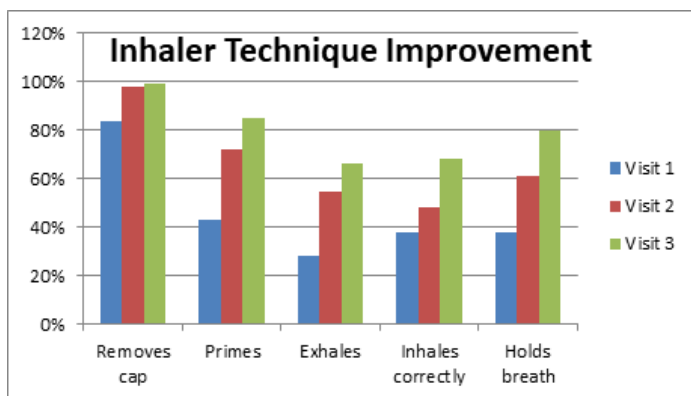
Children spend up to a 1/3 of their day at school and are at risk for coming into contact with multiple asthma triggers. The cornerstone of our trigger reduction program is through adoption of the EPA, Tools for Schools Quality Indoor Air Management program. Denver Public School District partnered with the local EPA office to improve indoor environment in Denver schools, including an extensive integrated Pest management program that has significantly reduced the use of pesticides in schools. Under the DPS Integrated Pest Management program, the use of rodenticides for the management of mice has been reduced by 75%. and pest complaints in schools reduced by as much as 90%. In addition, only low-risk human exposure pesticides are used in Denver's schools.

This program has not only successfully eliminated asthma triggers caused by cockroach and mice; but also reduced exposure to potentially harmful chemicals for over 92,000 DPS students including nearly 11,000 who have asthma. By ensuring a healthier learning environment in the schools, DPS is creating an environment that fosters academic achievement. When children who suffer from asthma are able to enter an environment where they can function without encountering asthma triggers in the buildings, absentee rates drop, and those children are not left to fall behind in their education due to missed school days.

Program outcomes:

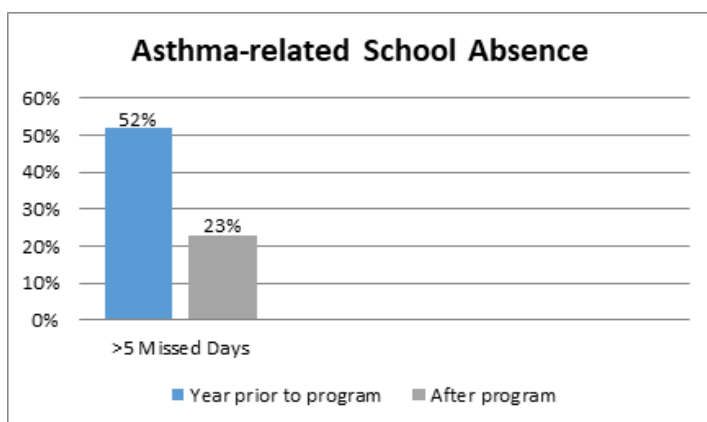
Results for the 2016-2017 school year reflect significant gains in self-management outcomes:

- Correct MDI/Spacer technique improved from 2.30 to 3.99 (scale of 0-5) (Figure 2 below)
- Asthma knowledge scores improved from a mean score of 72% at entry to 87% after intervention



Clinical outcomes included:

- 31% decrease in emergency department/urgent care visits (44% to 12%)
- 8% decrease in hospitalizations for asthma (12% to 4%)
- 29% decrease in asthma-related school absences >5 days (52% to 23%)



What's next:

The Step Up Asthma Program has demonstrated success over the past 12 years and has expanded to 5 new school districts. In addition to Denver Public Schools the program is being implemented in Aurora, Brighton, Englewood, Mapleton and Sheridan schools. We look forward to working with students, families, educators, school nurses and facility management in these new districts.

The Step Up Asthma Program is now part of a broader statewide grant initiative, Colorado Comprehensive School-Centered Asthma Programs, AsthmaCOMP. This new program will partner with the Colorado Department of Education and the Regional School Nurse Specialists to reach 5 additional front range and rural school communities including Colorado Springs, Cortez, Grand Junction, Greeley and LaMar Colorado. The emphasis is on supporting school communities across Colorado to implement standardized best asthma practices for schools. The EPA is an important partner in this grant and will help guide strategies for environmental improvement in the various geographically and socioeconomically diverse communities.

This work is Supported by the Cancer, Cardiovascular, and Chronic Pulmonary Disease Grants Program

Selected Publications:

Cicutto L, Gleason M, Szeffler SJ. Establishing school-centered asthma programs. *J Allergy Clin Immunol* 2014;134:1223-1230.

Liptzin DR, Gleason MC, Cicutto LC, Cleveland CL, Shocks DJ, White MK, Faino AV, Szeffler

SJ. Developing, Implementing, and Evaluating a School-Centered Asthma Program: Step-Up

Asthma Program. *J Allergy Clin Immunol Pract.* 2016 Sep-Oct;4(5):972-979.e1.

doi: 10.1016/j.jaip.2016.04.016. PubMed PMID: 27283054.

Featured Pest of the Month: Cockroaches

Cockroaches and their management

Cockroaches are among the most undesirable insect intruders in the home and schools. They are associated with filth and unsanitary conditions, although they occasionally invade the best-kept homes.

Though known to carry various disease organisms, cockroaches have not been associated with any major disease outbreaks in this country. The insects also produce a secretion that has a repulsive odor and can affect the flavor of food. Cockroaches can cause allergic reactions when sensitive people come into contact with contaminated food or house dust.

Biology and Development

Three cockroach life forms can be found in an infested area. The egg case is the size and shape of a bean and contains 10 to 20 cockroach eggs (Figure 1). The female may

carry the eggs around until just before they hatch or, in some species, she may hide them in some protected area. As the eggs hatch, young cockroaches, or nymphs, emerge. Similar in shape and color to the adults, they are smaller and wingless. Their habitats and food preferences are the same as those of adults.

Cockroaches are active at night, so daytime observation is a good sign of a heavy infestation. They prefer protected areas, such as cracks and crevices, to rest and hide. Although cockroaches prefer starchy foods and meats, they will eat anything of plant or animal origin.

Common Species in Colorado

There are more than 50 species of cockroaches in the United States. However, only five are likely to be found in Colorado and described below.

The **German cockroach** is the



Figure 1: Brown-banded and American cockroach egg cases.



Figure 2: German cockroach. (Photo from the K. Gray Image Collection, Oregon State University.)

most troublesome of all cockroaches. One of the smaller species, 1/2 inch when full grown, it is light brown with a pair of parallel brown bars between the head and the front of the wings (Figure 2). This species usually is associated with buildings where food is prepared or stored. It commonly migrates from infested areas into nearby dwellings or may be carried in on food containers. Favorite home habitats are warm, moist areas, such as kitchen sinks and appliances, bathroom sinks, and furnaces.

The **American cockroach** is the largest pest species found in Colorado — up to 2 inches long. It is mahogany-colored with a yellow margin around the head and around the shield behind the head (Figure 3). Although occasionally found in homes, the American cockroach more commonly is found in warm, moist areas of industrial or commercial buildings. Furnace or boiler rooms, sewers and heat tunnels are favored environments.



Figure 3: American cockroach. (Photo from the K. Gray Image Collection, Oregon State University.)

The **brownbanded cockroach** is similar in size and color to the German cockroach. It can be distinguished by the lack of brown bars on the shield in front of the wings and by the presence of two light bands across the wings and abdomen (Figure 4). It prefers a warmer, drier environment than the German cockroach and often is found in ceilings, light fixtures, furniture and appliances, especially televisions.



Figure 4: Brown-banded cockroach. (Photo from the K. Gray Image Collection, Oregon State University.)

The **oriental cockroach** is intermediate in size between the German and the American cockroach and much darker. The adults have wings that do not reach the end of the abdomen (Figure 5). Many consider it the most repulsive common cockroach, primarily due to its strong odor. This species prefers cool, damp, dark areas. For this reason, it often is

called a “water bug.” Common habitats include sewer drains, damp crawl spaces, basements and cellars. Infestations are most common in the spring and fall.



Figure 5: Oriental cockroach. (Photo from the K. Gray Image Collection, Oregon State University.)

The **wood cockroach** prefers the outdoors and usually is found in wood piles, in dead trees and under bark. Attracted to lights, it occasionally enters homes and causes great alarm because it is so easily confused with pest cockroaches. The wood cockroach has a white band that runs around the head and the shield behind the head. Usually it does not survive or multiply indoors.

Cockroach Management

The three keys to effective cockroach management are prevention and sanitation, detection and chemical control. Satisfactory cockroach control will not be achieved unless each of these steps is followed.

Prevention and Sanitation

If cockroaches are migrating into a building or from another part of a building, install weather stripping and caulking where plumbing passes from infested areas into uninfested areas. Eliminate hiding places. For example, caulk cracks and crevices in dark, moist areas to discourage cockroaches. Inspect items brought into a building, especially food containers, furniture, appliances and clothing. The adults and young are easy to recognize. Because some cockroaches glue their egg cases to various surfaces, take particular care to look for the eggs.

Cockroaches need food, water and shelter. Water is particularly important, which is why infestations are most common in kitchens and bathrooms. Make any plumbing repairs and modifications needed to eliminate as much standing water as possible.

Do not allow food particles to accumulate in areas accessible to cockroaches. Common feeding areas include unwashed dishes, pet dishes, uncovered pet food containers, litter boxes, waste containers, and areas under refrigerators, stoves, sinks and furniture. Repair faulty plumbing and eliminate unnecessary sources of water. Reduce shelter for cockroaches; do not store unnecessary newspapers, boxes, rags and similar items that provide hiding places.

Detection

Detection is an important element of cockroach control. Cockroaches tend to concentrate in certain areas. Controls are more effective if they are targeted at these spots. Cockroach traps, small, open-ended boxes, contain an attractant and sticky substance that retains the insects once they enter. Use them to locate infestations and to determine when populations require additional treatment. Traps can be effective in catching the occasional invader, but they will not eliminate established colonies. Traps are most effective when placed against walls under sinks, in cabinets and in basement corners. If two nights pass without a capture, move the trap to another likely area.

Chemical Control

Cockroach insecticides include residual sprays, nonresidual sprays, dusts and baits. Use a combination for effective chemical cockroach control.

All cockroach insecticide labels contain important instructions and precautions to ensure effectiveness and to protect the safety of humans and pets. **Read, understand and follow all label instructions** when applying any residual spray, nonresidual spray, dust or bait.

Residual insecticide sprays leave a toxic deposit on surfaces and will kill cockroaches for a certain time period, usually two to four weeks. Apply to cracks and crevices where cockroaches hide and areas where they walk in search of food. Spray until the surface is wet, but avoid overapplications that puddle or run off.

Insecticides are poisons and should be treated as such. Used improperly, they can damage linoleum, carpets, drapes and paint. Various insecticides, under a variety of commercial names, are available for residual treatments against cockroaches. Some products are available to homeowners, while others are limited to licensed pest control operators. Residual insecticide treatments are generally effective, but cockroaches, especially the German, have developed insecticide resistance in many parts of the country.

Nonresidual insecticide sprays eliminate cockroaches only on contact. They will not eliminate an infestation but are quite helpful when used with residual treatments. Several short-lasting aerosol insecticides contain the active ingredients pyrethrins or resmethrin. They irritate cockroaches and can flush the pests out of their hiding places and force them into areas treated with a residual insecticide. This flushing action also is useful to determine whether

or not cockroaches are present. Flushing agents, however, can drive them into previously uninfested parts of the building.

Insecticide dusts can penetrate cockroach hiding areas that other insecticides will not reach. When applied to dry locations, they have a longer useful life than residual sprays. Some dusts contain conventional insecticides, while others contain no organic chemicals.

Boric acid powder (also available as a residual spray), available under several commercial names, is relatively safe for humans, but do not expose children and pets to it. It can cause skin irritations if improperly handled, and it will harm house plants. Apply boric acid only to hiding places and runways. It is slow acting. Do not expect complete control for at least one week after application. Boric acid is among the best cockroach insecticides. Combined with its relative safety, this makes it a good choice for homeowners.

Other dusts are based on silica aerogel or diatomaceous earth. These are applied in the same manner as boric acid. They may not be as effective as boric acid because they are repellent to the cockroach. However, they can keep the pests out of certain areas, such as wall voids and attics. While boric acid is poisonous, silica aerogel and diatomaceous earth act by rubbing off the protective waxes that cover the cockroach's body and cause death by dehydration.

Baits can be applied to areas that cannot be sprayed or dusted. They consist of an attractant, such as peanut butter or syrup, and a nonrepellent insecticide, such as boric acid. Baits are long lasting and are most effective when placed in small amounts in many locations. Most baits are available in child- and petproof containers. Baits are much more effective if they are the only food source available. Good sanitation is especially important for this type of control.

Professional Pest Control

If the situation is severe or it is unclear what to do, professional pest control services are available. These companies employ trained pest control operators and have access to insecticides and equipment that are not available to private individuals. Choose a company with the same care you use to select other services for the home.

Biological Control

Biological control uses one organism to control another. Where insecticides are undesirable or it is

not necessary to eliminate cockroaches completely, consider a biological control program. Such programs have not been popular in the past because many find the biological control agent to be as distasteful as the cockroaches. Additionally, insecticide use would have to be minimized or eliminated, because the beneficial organism often is even more susceptible to insecticides than cockroaches.

Many kinds of organisms attack cockroaches: toads, bacteria, protozoa, beetles, mites and wasps. Parasitic wasps have had the most success. These are tiny insects, harmless to humans, that lay their eggs in the cockroach case. The eggs hatch into immature wasps that feed on the cockroach eggs. Wasps can reduce cockroach numbers dramatically and keep them at low levels, but they cannot completely eliminate the problem. Parasitic wasps have been used successfully in nonresidential office buildings and warehouses, but not in residential buildings where there is much less tolerance of cockroaches and other insects.

By Frank Peairs, Colorado State University Extension entomologist and professor, Bioagricultural Sciences and Pest management. Artwork by Thomas J. Weissling. 7/95 (Colorado State University Extension fact sheet number 5.553).

Current Pests: What Are You Seeing?

Arapahoe, Douglas, & Elbert Counties

Miller moths: Flights into areas often begin in early May.

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Spider mites: Clover mite populations should be peaking and may begin natural decline.

Sod webworms, cutworms: Damage to lawns by webworms and cutworms begin at this time.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Brownheaded ash sawfly: Pinhole feeding wounds indicate early stage infestations.

Honeylocust plant bug: Check trees for newly emerged nymphs.

Elm leaf beetle: Adults return to trees and chew holes in leaves.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Walnut twig beetle: Overwintered adults in trunk bark move to branches and begin tunneling.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on various fruit and shade trees. Forest tent caterpillars are also active.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Zimmerman pine moth: Period ending during which larval control is possible.

Miller moths: Peak flights typically occur at this time.

Honeybee swarms: Many honey bee colonies produce swarms during sunny days

Emerald ash borer: Adult emergence begins

Douglas-fir tussock moth: Egg hatch may begin. Monitor infested trees.

Brownheaded ash sawfly: Peak period of injury in most seasons.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberries, currant, rose.

Oak borers: Preventive treatments should be made at this time at high risk sites

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Pinyon tip moths: Larvae start to tunnel into terminals.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Honeylocust plant bug: Injury usually peaks towards end of month.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Strawberry injuries: Millipedes and slugs tunnel the ripening berries.

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Flea beetles: Adults are present on cabbage, radish and related plants.

Slugs: Slug injury should continue at high levels

Denver Metro Area

Miller moths: Flights into areas often begin in early May.

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Spider mites: Injury by banks grass mite increases. Clover mite populations should be decreasing.

Brownheaded ash sawfly: Continue to monitor ash for evidence of infestations.

European elm flea weevil: Adults chew emerging leaves and egg laying may begin

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Honeylocust podgall midge: Adults begin laying eggs on new growth. First generation begins.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Elm leaf beetle: Adults return to trees and chew holes in leaves.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on various fruit and shade trees. Forest tent caterpillars are also active.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Miller moths: Peak flights typically occur at this time.

Brownheaded ash sawfly: Peak period of injury in most seasons.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberrries, currant, rose.

Oak borers: Treatments should be made to high risk sites.

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

European elm flea weevil: Leafmting of larvae begins

Elm leafminer: Egg laying by adults may be expected.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Pinyon tip moths: Larvae start to tunnel into terminals.

Douglas-fir tussock moth: Egg hatch may begin. Monitor infested trees.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

European elm scale: Overwintered females feed intensively and begin to produce large amounts of honeydew.

European elm bark beetle: Adults emerge and feed on twigs. Most new transmission of Dutch elm disease occurs at this time.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Strawberry injuries: Millipedes and slugs tunnel the ripening berries.

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Flea beetles: Adults are present on cabbage family (crucifer flea beetles) and nightshade family (potato flea beetle) plants.

Eastern Plains Counties

Miller moths: Flight sometimes begin in early May.

Millipedes: Cool wet, weather may trigger migrations of millipedes from lawns

Spider mites: Injury by banks grass mite increases. Clover mite populations should be decreasing.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Honeylocust podgall midge: Adults begin laying eggs on new growth. First generation begins.

Elm leaf beetle: Adults return to trees and chew holes in leaves.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on various fruit and shade trees. Forest tent caterpillars are also active.

Ash sawfly: Early feeding injury should be present. Optimum time for treatment in most seasons.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Flea beetles: Larvae chew small holes in many garden plants and may kill seedlings.

Strawberry injuries: Millipedes and slugs tunnel ripening berries.

Miller moths: Peak flights typically occur at this time.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberry, currant, rose.

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Ash sawfly: Peak feeding by larvae often occurs at this time.

European elm scale: Overwintered females feed intensively and begin to produce large amounts of honeydew.

Rose/apple leafhoppers: Peak injury to foliage of rose. Apple leafhopper may damage apple foliage.

European elm bark beetle: Adults emerge and feed on twigs. Most new transmission of Dutch elm disease occurs at this time.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Root weevils: Leaf notching of some shrubs and perennials may begin to be observed

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Crucifer flea beetles: Adults are present on cabbage, radish and related plants.

Apple flea beetle: Larvae are feeding on evening primrose

Striped cucumber beetle: Overwintered adults become active and may damage emerging squash, pumpkins, melons

El Paso & Teller Counties

Miller moths: Flights into areas often begin in early May.

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Spider mites: Clover mite populations should be peaking and may begin natural decline.

Sod webworms, cutworms: Damage to lawns by webworms and cutworms begin at this time.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Brownheaded ash sawfly: Pinhole feeding wounds indicate early stage infestations.

Honeylocust plant bug: Check trees for newly emerged nymphs.

Elm leaf beetle: Adults return to trees and chew holes in leaves.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on various fruit and shade trees. Forest tent caterpillars are also active.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Walnut twig beetle: Adults move from overwintering chambers in bark to branches and initiate new tunnels.

Zimmerman pine moth: Period ending during which larval control is possible.

Miller moths: Peak flights typically occur at this time.

Honeybee swarms: Many honeybee colonies produce swarms during sunny days

Brownheaded ash sawfly: Peak period of injury in most seasons.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberrys, currant, rose.

Oak borers: Preventive treatments should be made at this time at high risk sites

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Pinyon tip moths: Larvae start to tunnel into terminals.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Honeylocust plant bug: Injury usually peaks towards end of month.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Strawberry injuries: Millipedes and slugs tunnel the ripening berries.

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Flea beetles: Adults are present on cabbage, radish and related plants.

Slugs: Slug injury should continue at high levels

High Country Counties

Miller moths: Flights into areas often begin in early May.

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Spider mites: Clover mite populations should be peaking and may begin natural decline.

Sod webworms, cutworms: Damage to lawns by webworms and cutworms begin at this time.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Western spruce budworm: Overwintered larvae begin to tunnel buds and flowers. Check for early stages of infestations.

Elm leaf beetle: Adults return to trees and chew holes in leaves.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on aspen and various fruit and shade trees. Forest tent caterpillars are also active on aspen and ash.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Blackhorned pine borer: Adult emergence and egg laying typically occurs at this time.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberrries, currant, rose.

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Douglas-fir beetle: Attacks on new trees by overwintered adults may begin.

Oak defoliators: Loopers and leafrollers may begin to defoliate oak stands.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Cicada: Adult emergence of common species usually occurs at this time.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Grasshoppers: Eggs may begin to hatch of early hatching species (e.g., clearwinged grasshopper)

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Strawberry injuries: Millipedes and slugs tunnel the ripening berries.

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Flea beetles: Adults are present on cabbage, radish and related plants.

Northern Front Range

Miller moths: Flights into areas often begin in early May.

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Honey bee swarms: Honey bee swarming may occur during sunny afternoons

Spider mites: Injury by Banks grass mite increases. Clover mite populations should be decreasing.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Honeylocust podgall midge: Adults begin laying eggs on new growth. First generation begins.

European elm flea weevil: Shotholes appear from adult feeding damage. Eggs are laid at leaf veins.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on various fruit and shade trees. Forest tent caterpillars are also active.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Walnut twig beetle: Overwintered beetles initiate tunnels of first generation.

Miller moths: Peak flights typically occur at this time.

Honey bee swarms: Peak period of honey bee swarming.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Emerald ash borer: Adults should begin to emerge and move to leaves to feed.

European elm flea weevil: Leaf mining occurs.

Elm leafminer: Early stages of leafmining.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberrries, currant, rose.

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Pinyon tip moths: Larvae start to tunnel into terminals.

Douglas-fir tussock moth: Egg hatch may begin. Monitor infested trees.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

European elm scale: Overwintered females feed intensively and begin to produce large amounts of honeydew.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Currantworm: Larvae chew leaves of current and gooseberry. Damage starts in the interior of shrub.

Strawberry injuries: Millipedes and slugs tunnel the ripening berries.

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Flea beetles: Adults are present on cabbage, radish and related plants.

Pueblo & Fremont Counties

Miller moths: Flights into areas often begin in early May.

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Spider mites: Injury by banks grass mite increases. Clover mite populations should be decreasing.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Honeylocust podgall midge: Adults begin laying eggs on new growth. First generation begins.

Elm leaf beetle: Adults return to trees and chew holes in leaves.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on various fruit and shade trees. Forest tent caterpillars are also active.

Ash sawfly: Early feeding injury should be present. Optimum time for treatment in most seasons.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Flea beetles: Larvae chew small holes in many garden plants and may kill seedlings.

Strawberry injuries: Millipedes and slugs tunnel ripening berries.

Miller moths: Peak flights typically occur at this time.

Pine needle scale: Crawler emergence typically begins around mid May, about the time of lilac peak bloom. Check infested plants.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberries, currant, rose.

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Ash sawfly: Peak feeding by larvae often occurs at this time.

European elm scale: Overwintered females feed intensively and begin to produce large amounts of honeydew.

Rose/apple leafhoppers: Peak injury to foliage of rose. Apple leafhopper may damage apple foliage.

European elm bark beetle: Adults emerge and feed on twigs. Most new transmission of Dutch elm disease occurs at this time.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Narcissus bulb fly: Adult stages emerge and lay eggs on narcissus, daffodils, and hyacinth.

Flea beetles: Adults are present on cabbage, radish and related plants.

Striped cucumber beetle: Overwintered adults become active and may damage emerging squash, pumpkins, melons

Southwestern Counties

Tick season: The next two months are the peak season for tick activity and spread of Colorado tick fever.

Spider mites: Clover mite populations should be peaking and may begin natural decline.

Sod webworms, cutworms: Damage to lawns by webworms and cutworms begin at this time.

Hackberry psyllid: Adults return to trees and lay eggs on the emerging leaves.

Western spruce budworm: Overwintered larvae begin to tunnel buds and flowers. Check for early stages of infestations.

Southwestern pine tip moth: Egg-laying occurs when new needles emerge on pines.

Honeylocust plant bug: Nymphs have hatched and begin to damage new growth.

Peach tree borer: Larvae causing peak injury to bases of trees at this time

Tent caterpillars: Larvae may be seen making tents on aspen and various fruit and shade trees. Forest tent caterpillars are also active on aspen and ash.

Slugs: Slugs may cause peak damage to seedlings during cooler weather.

Cooley spruce gall: Eggs hatch and young nymphs move to feed on new growth. Galls are initiated.

Pine needle scale: Egg hatch may begin during warm seasons.

Oystershell scale: Crawler emergence typically occurs in late May. Check infested plants.

Bronzed cane borer/rose stem girdler: Adults emerge from caneberries, currant, rose.

Fruittree leafrollers: Leafrolling may begin to be observed on many trees/shrubs.

Hackberry psyllid: Current season galls begin to be visible as small eruptions on leaves.

Oak defoliators: Loopers, Sonoran tent caterpillars, and leafrollers may begin to defoliate oak stands.

Cooley spruce gall: Current season galls are readily visible upon close inspection. Small nymphs are present in chambers of the gall.

Rabbitbrush beetle: Peak feeding injury by larvae.

Leafcurling aphids: Aphids curl the new growth of many plants at this time.

Codling moth: Sprays after petal fall can help control the first generation. Monitor flights with pheromone traps.

Cicadas: Adult emergence of common species (e.g., Putnam's cicada) usually occurs at this time.

Slugs: A peak period of activity and injury.

Seedcorn maggot: Early planted beans, corn, and melons are susceptible to seedcorn maggot damage.

Strawberry injuries: Millipedes and slugs tunnel the ripening berries.

Asparagus beetle: Adults chew on spears and lay eggs

Flea beetles: Adults are present on cabbage, radish and related plants.

Source: <http://bspm.agsci.colostate.edu/outreach-button/insect-information/> (Yard/Garden Insect Calendars)

Credits

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