



2012 – 2013
INTEGRATED PEST MANAGEMENT
School Recordkeeping Calendar



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About IPM

Integrated pest management (IPM) focuses on long-term prevention of pest problems through a combination of techniques such as identifying and monitoring pests, keeping records, using nonchemical practices and understanding pest biology. Pesticides that pose the least possible harm to people and the environment are used only when needed.

The Healthy Schools Act

The Healthy Schools Act (HSA) requires each school to keep records of every pesticide application for four years, except certain exempted pesticides. Records must include the pesticide product name, manufacturer's name, U.S. EPA registration number, date and areas of application, reason for application, and amount of pesticide used. Records must be available to the public upon request. In a 2007 Department of Pesticide Regulation (DPR) survey of California school districts, results show that at least 16 percent of school districts did not keep these records.



DPR sponsored IPM training is available for school IPM coordinators and other staff responsible for pest management. These one-day workshops review IPM principles and use hands-on training (like this soil analysis exercise) in how to manage pests around buildings and grounds using IPM.

Check www.cdpr.ca.gov/schoolipm



FOR MORE DETAILS ON PREVENTING AND MANAGING PEST PROBLEMS

- Visit the DPR School IPM Web site at:
www.cdpr.ca.gov/schoolipm
- Visit the University of California Statewide IPM Program Web site at: www.ipm.ucdavis.edu This website includes many useful features for school pest managers, including Pest Notes on how to manage more than 150 common pest problems, photo galleries of natural enemies and weeds, an easy-to-use key for ant identification, and the UC Guide for Healthy Lawns.

About This Calendar

The school IPM calendar is designed as a planning tool for the management of major pests of school buildings and grounds. It is intended for use by school maintenance and operations staff to serve as a reminder of pest management procedures by month, to help integrate pest management with other school maintenance activities, and to provide a handy location to record monitoring results and management practices completed. The calendar features a major pest each month with tips that highlight the major elements of an IPM strategy for that pest. Each month, the calendar focuses on either timing of management practices as they relate to the pest life cycle or to the scheduling of other school maintenance activities. For example the yellowjacket is featured in April and effective management is closely tied to the life cycle; queens should be trapped at this time of year before they establish nests. In contrast, the mouse, featured in November, can be effectively managed year round. November is a good time to plan prevention measures to carry out during the upcoming holiday breaks when school is not in session.

Recordkeeping

This calendar is intended to help in your pest management recordkeeping. So what does good recordkeeping involve? You should keep records of information gathered on pests and the problems they cause, as well as of pesticide use on school grounds. Knowing when, where, and what pests are seen, their numbers, and the extent of actual or potential damage at each location will help you to focus your district's pest management efforts. This knowledge enables you to anticipate conditions that trigger pest problems and thus prevent them from occurring or deal with them before they become more serious. Recordkeeping also provides the important documentation needed to justify budget requests for pest management tools and materials.



Tips to control fall turf weeds

Adequate irrigation, fertility and turf selection are critical to healthy turf.

- Determine why weeds are present and correct the underlying problems (for instance, overwatering, overfertilizing, compaction).
 - Mow to maintain the optimum height for your turf type; remove less than one-third of the blade at a time.
 - Fertilize this month if your turf still requires mowing.
 - Check sprinkler heads regularly to make sure they are working properly.
 - Water deep and infrequently, and follow the recommended rate for your location, turf type, and weather.
 - Overseed with appropriate turf species in early fall.
 - Remove weeds before they set seed. Use herbicides as a last resort and combine with proper care.
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Other Pests

- Ants: Use baits outside. Inside a building, place bait where ants are entering.
- Oriental and Turkestan cockroaches: Place bait in water boxes outside.
- German cockroaches: Monitor in kitchens.
- Rats and mice: Install and maintain pest-proof garbage containers.
- Ants, yellowjackets, cockroaches, mice and rats: Empty trash daily to eliminate food sources.

Maintain a healthy, vigorous lawn to prevent weeds. Remember soil management is key to a healthy lawn.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1



Keep mower blades sharp.

Record of Management Activities

Date	Task	Results



Hairy crabgrass in turf.



Healthy turf needs aeration.



Tips to control non-turf weeds

Eliminate bare ground by using mulches, fabric, and ground covers to prevent weed infestations.

- Know your weeds! Identify annual, perennial, grass, or broadleaf weeds and get assistance to determine genus and species of common weeds.
 - Monitor landscape beds and hardscapes for weeds; focus on highly visible areas.
 - Install competitive plantings to avoid bare soil.
 - Use weed fabric in new plantings.
 - Mulch – monitor & maintain a three-inch depth at all times.
 - Scrape small weeds out of the cracks in asphalt and sidewalks.
 - Use botanical or least-toxic herbicides for newly germinated weeds.
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Other Pests

- Gophers: Concentrate on trapping, especially in irrigated areas – gopher activity is peaking for the fall.
- Ants, yellowjackets, cockroaches, mice and rats: Use trash bags in all containers and install tight-fitting lids.
- Yellowjackets: Searching for sweets and protein —wash out sugary recyclable cans and bottles.
- Cockroaches: Identify correctly! Don't worry about field cockroaches; they will not reproduce inside buildings.
- Ants and rats: Remove dense vegetation (like ivy) next to buildings to reduce access.

This is the best time for mechanical control or botanical herbicides, when winter weeds are newly germinated.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						



Three inches of mulch will suppress weeds.

Record of Management Activities		
Date	Task	Results



Hand-pull emerging weeds. Hoe young weeds.





Tips to control ground squirrels

Check burrows to be sure you have active populations and begin to monitor population levels.

- Control vegetation on school grounds including athletic field edges, borders, banks and rights-of-way to enhance monitoring for ground squirrel burrowing activity.
 - If possible, control ground squirrels before the young emerge in spring and become independent.
 - Mid-May through mid-July is usually a good time to control ground squirrels using traps or bait stations, as native vegetation and food sources are drying.
 - In some areas, ground squirrels aestivate (summer sleep) during the hottest summer months (mid-July through August). This is a poor time to attempt control.
 - Fall is also a good time for baiting as ground squirrel foraging activity peaks in September and October prior to hibernation.
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Other Pests

- Turf: Don't mow if the ground is wet. Rutted and uneven sports fields can cause as many tripping hazards as a family of ground squirrels.
- Weeds: Install mowing strips, raise bottom of fencing to allow line trimmer access, repair pavement cracks and alter traffic patterns to reduce compaction.
- Rats: Clean up school vegetable gardens and any fruit and nut trees that provide food.
- Rats and mice: Check traps and bait stations frequently.

Winter is a poor time for ground squirrel control efforts.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3



A conibear trap is set over the entrance to a ground squirrel burrow.

Record of Management Activities		
Date	Task	Results



Typical ground squirrel burrows. Monitor for active burrows.





Tips on controlling mice

Periodically check for droppings, fresh gnaw marks, and tracks that indicate areas where mice are active.

- The best time for management tactics is when school is not in session.
- Monitor year round. Talcum powder or white flour can be used as tracking powder. Disturbed powder or tracks can confirm their presence in areas of suspected activity.
- If possible, inspect adjacent property because mice may soon invade from this direction.
- Set traps behind objects, in dark corners, and in places where there is evidence of mouse activity.
- Use more traps than are thought reasonable.
- Think prevention: it is more effective to control rodents before their numbers get high.
- Exclusion is the most permanent form of house mouse control. Seal cracks in building foundations and eliminate all gaps and openings larger than 1/4 inch.

Other Pests

- German cockroaches: Identify and continue to monitor in kitchens.
- Pigeons: Remove nests twice per week and modify roosting sites to make the area inhospitable. If exclusion fails, trap and euthanize (if released, they will return). Don't feed the pigeons!

Mice activity and mating take place year round with as many as ten generations per year.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1



Installation of door sweep needed to keep out mice and cockroaches.



Droppings are characteristic of pest. Mouse (left), roof rat (center), and Norway rat (right) droppings.

Record of Management Activities		
Date	Task	Results



Tips on controlling tree pests

Inspect trees regularly to detect, identify, and record pests and causes of damage.

- List the tree species in your landscape and identify cultural needs for each, using resources such as the Sunset Western Garden Book.
- Consult resources such as UC's Pests of Landscape Trees and Shrubs for information on pest identification and management.
- Protect trees from injury. Physical damage from people, equipment, and construction along with improper irrigation are the leading causes of tree stress.

Develop a plan for tree management such as:

- Provide staff with more training and resources.
- Gradually replace problem trees while making sure that each new tree is planted in the right place with proper soil, sunlight and water.
- Research and select trees that provide the shade and ambiance benefits you seek without growth characteristics that may cause hazards through dropped fruit or cones, or exposed roots.

Other Pests

- This is a good time to review structural and landscape pest management contracts.
- Yellowjackets: Repair windows and screens and caulk openings in walls to prevent nesting in wall voids.
- Cockroaches: Monitor for German cockroaches in kitchens.
- Rats: Monitor for rat presence such as fresh droppings and chewing damage.

Liquidambar tree seed pods are a pain both on walkways and in lawns. Avoid tree problems with proper choice of trees.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



Lerp psyllid on eucalyptus.

Record of Management Activities		
Date	Task	Results



Before acting, identify insects and don't spray good bugs.



Poor water management leads to disease.

CALIFORNIA SCHOOL IPM PROGRAM
www.cdpr.ca.gov/schoolipm



Tips on controlling gophers

Trap and control populations in winter and early spring when populations are low, prior to breeding.

- Maintain healthy turf by aerating and overseeding.
 - Minimize white clover and other herbaceous weeds which are preferred food for gophers.
 - Monitor weekly: count active mounds, evaluate field conditions for weeds, note possible points of incursion.
 - Begin trapping within and around areas of high priority with box or impale traps.
 - Identify areas where gophers are moving onto school grounds, and where possible install exclusion fencing along fencelines, at least 24" deep, 18" above the level of the soil.
 - Population activity will increase in April and May; continue to monitor and trap to keep population in check.
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Other Pests

- Ground squirrels: Hibernating at this time; a poor time to attempt control.
- Ants, yellowjackets, cockroaches, mice and rats: Empty trash daily to eliminate potential food sources.
- Non-turf weeds: Flame or heat treat in hardscapes and irrigated landscapes.
- This is a poor time to plant trees and shrubs since the soil is too wet, leading to soil compaction, disease development and weeds.

Gopher activity begins to increase in January and, in most areas, mating will begin at the end of March.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2



Look for newly formed gopher mounds.

Record of Management Activities

Date	Task	Results



Place trap in runway, covering the opening.



Probe around mounds to locate the main runway.



Tips on controlling ants

Use baits, not perimeter sprays. Early season baiting for ants is effective to keep ant populations from getting out of hand.

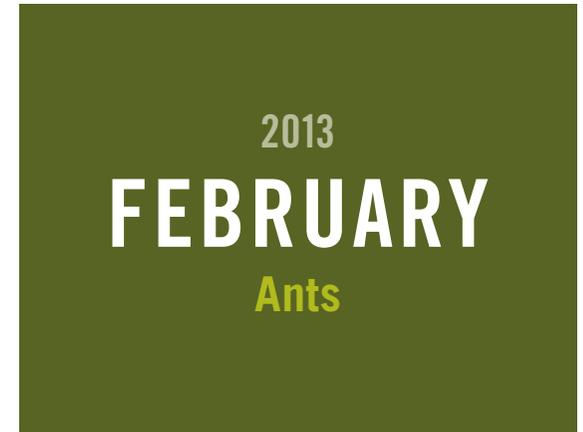
- Identify common ants:
ucipm.ucdavis.edu/Tools/Antkey
 - Outside control (starting in February)
 - Locate nests and apply baits.
 - Baiting outside keeps ants outside, but sometimes it is necessary to bait inside; place bait inside only where ants are entering the room.
 - Eliminate access by sealing cracks and trimming away tree and shrub contacts with buildings.
 - Inside control (year round)
 - Clean up ants with soapy water, especially peppermint soap (HSA exempt).
 - Clean up food or items that may attract and bring ants inside.
 - Sugar baits are effective year round, but protein baits are most effective in the spring.
-

Other Pests

- Gophers: Trap! Population activity is increasing; mating will begin by the end of the month.
- German cockroaches: Monitor kitchens and bait if detected.
- Ground squirrels: Breeding season has begun: monitor for increasing activity.

Prevention and persistence are the keys to ant management.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	1	2



Ant bait station.

Record of Management Activities		
Date	Task	Results



Prevent ants by sealing cracks.



Ant bait stations are good IPM.



Tips to control spring turf weeds

This is a good time to apply slow-release organic fertilizers as recommended by a soil analysis – avoid water-soluble fertilizers that can leach as nitrate into groundwater.

- Monitor and identify weeds: record type and location.
 - Control young weeds by hand pulling, hoeing or flaming.
 - Aerate turf, de-thatch if needed, overseed with appropriate variety of grass seed.
 - Avoid mowing stress: mow high (2½ to 3 inches), mow often, mow when turf is dry, and keep mower blades sharp.
 - Improve weed management by installing mowing strips, raising fencing to allow line trimmer access, repairing pavement cracks, and altering traffic patterns to reduce compaction.
-

Other Pests

- Ground squirrels: Trapping is a treatment option in early spring.
- Non-turf: Monitor emerging weed seedlings and control.
- All weeds: Summer annuals are growing in Southern California and germinating in Central and Northern California. The best time to control is when they are still small.

The common daisy crowds out grass. Proper care in spring results in turf that resists weed invasion all year.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
24	25	26	27	28	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						



Water management is critical in spring.

Record of Management Activities		
Date	Task	Results



Annual bluegrass seed head.

Healthy turf needs aeration.



Tips on controlling yellowjackets

Pay attention to yellowjackets in early spring to avoid a bigger problem later in summer and fall.

- Put out lure or water traps to catch queens before they establish nests and rear more yellowjackets.
 - Place traps away from areas frequented by students.
 - Use protein-containing baits, such as cat food or turkey ham this month and throughout early spring. Switch to sugar-based traps in summer and fall.
 - Locate yellowjacket nests during the day and then return in cool of morning before dawn to carefully treat nests.
 - Empty and clean garbage containers and garbage container lids frequently.
 - When feasible use self-closing garbage cans to shut out wasps.
 - Wash out recyclable cans and bottles.
-

Other Pests

- Rats: Remove vegetation near buildings that provide shelter and travel bridges.
- Gophers: Populations increasing! Continue trapping as needed.
- Ants: Switch baits to a protein base.

Yellowjackets are often very aggressive. Rinse recyclables to reduce wasp encounters and painful stings.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4



Trap to monitor and reduce numbers.

Record of Management Activities		
Date	Task	Results



Nests are below ground and can be very large and tended by many wasps. Approach with caution as wasps will defend nest and readily sting.



Tips on controlling cockroaches

Sanitation and exclusion are important prevention strategies to manage cockroaches in buildings.

- Learn how to distinguish a field cockroach from a German cockroach. Field cockroaches and German cockroaches are very similar in size and markings except that field cockroaches viewed from below have a dark line between their eyes. Field cockroaches live outside and may come inside in the fall. Installing weather stripping around doors and vacuuming is probably sufficient for their control.
 - Place sticky traps behind refrigerators, sinks, and next to walls; cockroaches rarely venture into the middle of a room.
 - Use a HEPA-filtered vacuum to remove cockroaches before beginning a baiting program.
 - Put bait in valve boxes for Oriental and Turkestan cockroaches. Monitor for these cockroaches under and between concrete slabs.
 - German cockroaches hide in cracks and crevices, so place small drops of gel bait in these areas.
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Other Pests

- Pigeons: Look for evidence of pigeon activity. Record location of birds at dawn, mid-day and evening to determine where building modifications will be most effective.
- Rats and mice: Look for droppings, fresh gnaw marks, and tracks that indicate activity.
- Gophers: Trap, trap, trap; activity is increasing.

Eliminate food, water and shelter as much as possible to drastically reduce cockroach infestations.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

2013
MAY
Cockroaches



Identification leads to effective management.



Use flashlight and extending mirror to inspect hiding places.



Oriental cockroach entering pheromone trap.

Record of Management Activities		
Date	Task	Results

Tips on controlling rats

Combined practices, including sanitation, rat-proofing and snap traps, should be used to manage rat infestations.

- Identify the species; management for Norway and roof rats can be different.
- Monitor throughout the year, looking for rat droppings and chewing damage.
- Thin or remove vegetation near buildings that provide rats with shelter and travel bridges.
- Seal or screen openings larger than 1/4 inch in diameter to exclude rats and mice.
- Place traps along walls and check frequently. Rats are very cautious; leaving traps baited, but unset for several days (pre-baiting) will improve trap catches once actual trapping begins.

Other Pests

- Ground squirrels: Install barriers to prevent digging under structures; treated grain baits are effective because squirrels normally feed on seeds during this period.
- Pigeons: Install roosting deterrents, like 80-pound monofilament line, 1 to 2 feet apart over frequented and sensitive areas. Seal all openings to eaves, lofts and steeples.
- Trees: This is a good time to prune trees susceptible to diseases, such as anthracnose, and bacterial diseases like cankers.



Norway rat. Effective management relies on type of rat, monitoring and location of rats.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						



Without screening—the pipe becomes a freeway for rats.

Record of Management Activities		
Date	Task	Results



Droppings are characteristic of pest. Mouse (left), roof rat (center), and Norway rat (right) droppings.



Tips on controlling pigeons

Habitat modification to deter roosting pigeons is a good long-term solution to pigeon problems.

- Reduce perching sites—convert flat surfaces to 45-degree angles using wood, sheet metal, styrofoam or plexiglass.
 - If structure's design is for the birds and cannot be modified, use wire spikes or bird netting to discourage roosting and nesting. Netting must be kept sealed to be effective and is more subject to vandalism.
 - Remove or repair dripping faucets or other sources of water.
 - Pigeon nests: knock down and destroy in late winter and again in summer.
 - What doesn't work:
 - Ultrasonics and other periodic noise devices.
 - Owl decoys and other scare techniques (fake snakes, balloons, flags, and flashing lights).
-

Other Pests

- Ground squirrels: They aestivate (summer sleep) during the hottest summer months so control efforts are not warranted.
- Ants, yellowjackets, cockroaches, mice and rats: Empty trash daily to eliminate food sources and keep populations in check.
- Turf: Check water requirements and adjust sprinklers to the recommended rate. Check sprinklers to be sure all are working.

Pigeons produce young all year round, though peak breeding season is in the spring and fall.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3



Owl decoys do not work.

Record of Management Activities		
Date	Task	Results



Deter pigeons with 45-degree angles.



Discourage roosting and nesting with wire spikes.

THE 2012 – 2013 IPM CALENDAR AT A GLANCE

					
AUGUST-2012 <i>fall turf weeds</i>	SEPTEMBER-2012 <i>non-turf weeds</i>	OCTOBER-2012 <i>ground squirrels</i>	NOVEMBER-2012 <i>mice</i>	DECEMBER-2012 <i>trees</i>	JANUARY-2013 <i>gophers</i>
					
FEBRUARY-2013 <i>ants</i>	MARCH-2013 <i>spring turf weeds</i>	APRIL-2013 <i>yellowjackets</i>	MAY-2013 <i>cockroaches</i>	JUNE-2013 <i>mice</i>	JULY-2013 <i>pigeons</i>

PHOTO CREDITS

Cover and Monthly Feature Photos - all are from myrmecos.net and the four plant photos (DPR).

EXCEPT for the following images:
The school IPM training photo (DPR)

August – mower (istockphoto); hairy crabgrass (Clyde L. Elmore, UCIPM); healthy turf (Steven E. Lock, UCIPM).

November – door sweep needed (Ingrid Carmean);

rodent droppings (William Gelling, UCIPM).
January – look for mounds (istockphoto); place trap (DPR); probe around mounds (DPR).

February – sealing cracks (Michael Baefsky);

good IPM (DPR).
March – healthy turf (Steven E. Lock, UCIPM).

April – nest illustration (Arthur L. Antonelli);

Washington State University via UCIPM).
May – cockroach identification (Ingrid Carmean);

inspect hiding places (Cheryl A. Reynolds, UCIPM).

June – rat freeway (DPR); rodent droppings (William Gelling, UCIPM).

July – deter pigeons (DPR); owl decoy (Jurek Durczak).

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University of California
Statewide IPM Program
www.ipm.ucdavis.edu

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