INTEGRATED PEST MANAGEMENT CONTINUING EDUCATION FOR MAINTENANCE GARDENERS

DPR PEST MANANGEMENT ALLIANCE GRANT
DPR Grant No. 09-PML-G001

FINAL REPORT: MAY 2012

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Final Report

Executive Summary

Project objectives focused on providing Integrated Pest Management (IPM) education for Maintenance Gardeners as well as the retail suppliers at point of sale. We relied on peer trainers as a key component of the program. Desired outcomes included improved decisions about pest management by Maintenance Gardeners in local landscapes, safer working conditions, reductions in pesticide use /misuse, and improved business skills for Gardeners. This project was married to a CA Department of Pesticide Regulation pilot project to increase the number of Maintenance Gardeners licensed in San Luis Obispo County.

The Project Team included members of the San Luis Obispo County Agricultural Commissioner, UC Cooperative Extension and UC IPM Program, the Cal Poly San Luis Obispo Horticulture / Crop Science Department and the Pesticide Applicators Professional Association (PAPA). Project Partners included local PCAs and representatives from the Environmental Center of San Luis Obispo.

From previous work, we knew the availability of pesticide and IPM education for Maintenance Gardeners is poor in many locations in California. Information sources for pesticide and IPM information identified by Maintenance Gardeners included peers, PAPA, vendors, and word of mouth. Decisions on pesticides are often dictated by clients.

To develop a curriculum and individual programs for Maintenance Gardener we packaged Conventional IPM systems and materials, which were predominantly UC IPM resources. In some cases where Spanish language materials were not available, we translated existing materials.
Twelve workshops were held in 2010 in each of three locations (Paso Robles, San Luis Obispo, and Arroyo Grande) including

- Winter - Retail employees at point of sale
- Spring – Vertebrate pest control
- Summer – Weed control in lawns
- Fall – Insect and disease control

Retail trainings relied on materials previously developed for outreach to this clientele by UC IPM. Maintenance Gardener workshops relied on materials developed for home gardeners by UC IPM and the UC Master Gardener Program. These materials are consistent with practices and materials that would be available to most residential Maintenance Gardeners. In some cases we developed materials for special local problems. Several of these materials have already appeared in the UC IPM Green Bulletin on-line publication for landscape and pest management professionals.

The Project Team engaged 2 Peer Trainers to work with the Project Team at each of 3 training

locations to promote peer to peer training that capitalizes on leaders within the community. Peer Trainers included a local Retail Employee and PCA who is the primary contact for Maintenance Gardeners at her location, and a local Landscape Contractor. The Peer Trainers were involved in the presentations of each of the workshops, and encouraged participation by their colleagues.

Attendees at all workshops were encouraged to complete retrospective self evaluation regarding their confidence level in the materials and concepts presented at the workshops. Attendees received their incentives after completing the evaluation. Participants were asked to rate their confidence in controlling vertebrates, weeds, or insects and diseases (depending on workshop) before the workshop and then their confidence level "now that you had the training". In all cases but one, respondents reported either no change or an improvement in their confidence level. Of the 95 individual workshop evaluation responses, 21 responses indicated no change in confidence level regarding IPM practices. In general these individuals ranked themselves as confident or very confident in the material for both responses. As an example, there were 39 attendees at the Pests and Diseases workshops. Of the respondents to the post workshop survey, 100% indicated that they received useful information and 90% found the workshops good or excellent. The majority felt they could incorporate the information into their work within 6 months. In measuring their confidence in diagnosing pest and disease problems (on a scale of 1 to 5 being most confident) respondents reported a confidence level of 2.4 to 3.1 before the workshops and 3.9 to 4.0 after the workshops. Seven of the 38 respondents reported no change in confidence level as a result of participation.

From information gathered in post-program phone interviews, respondents noted that they used fewer pesticides because of the training, learned about application safety (in licensing workshops) and trained their employees. One respondent noted they had not made any changes because "the training did not affect how the customers wanted the work done". Those who noted it was not easy to find pest control products mentioned language barriers, lack of softer options, not knowing where to get safer products, and not easy to ask questions sometimes as reasons. Several of the respondents, when asked what else project staff could do to help them use safer products mentioned a need for education of homeowners and suggested bringing customers and gardeners together. All indicated a desire for future workshops.

Key findings from this project included

- The importance of engaging point of sale contacts for Maintenance Gardeners
  - Retail garden center and nursery staff for local businesses were easier to engage and more responsive to invitations than those at larger chains. Employees at larger retail chain nurseries noted that decision regarding products were not made locally
  - This is complicated by the turn-over in retail staff. In this project more than 70% of the retail staff trained were no longer in the same position or with the same company 18 months later.
- Timing of training depends on accounts – commercial vs. residential.
  - Maintenance Gardeners with commercial accounts, where work needs to be completed prior to businesses opening, did not prefer early training (e.g. 7am). Residential Maintenance Gardeners preferred the early trainings over those suggested in the afternoon or on weekends.

- The community of Maintenance Gardeners is mobile and it's difficult to maintain communications or contact. Follow-up from workshop to workshop was challenged by changes in address and phone numbers.
- Licensing systems that require Maintenance Gardeners to participate in more complex local business licensing and insurance requirements may be unlikely to promote goals related to reduction of pesticide use in residential landscapes. Careful thought should be directed towards program goals – urban pesticide use reduction or licensing of Maintenance Gardeners.

Potential next steps in process at the time of submission of this report include efforts by UC IPM to investigate the development of Smartphone applications for IPM information for Maintenance Gardeners. Additionally this may be supported by the development of a year-round IPM program for maintenance gardeners for key pests in the landscape. Continuing education programs in IPM for Maintenance Gardeners are continuing in San Luis Obispo County, with sessions held in June 2011, May 2012 and planned for June 2012**.**

Scope of work

Goal 1. Influence a change in the pest management practices of at least 90 San Luis Obispo County Maintenance Gardeners and at least 3 retail sales locations through participation in IPM training that leads to improved decisions about pesticide choices, and alternatives to pesticides.

1.1. Promote Integrated Pest Management (IPM) training of participating retail sales employees who provide pesticide sales to Maintenance Gardeners, with knowledge gained indicated by improved scores between pre- and post surveys.

1.1.1. Inventory and adapt IPM tools, resources and aids available for retail employees.

The Project Team inventoried and adapted existing IPM materials from programs such as UCIPM, Department of Pesticide Regulation's California School Integrated Pest management Program and Green Gardener Program for Santa Barbara County.

- http://www.ipm.ucdavis.edu
- http://apps.cdpr.ca.gov/schoolipm/
- http://www.greengardener.org/

1.1.2. Gain commitment and participation of retail sales employees.

Outreach was conducted by calling local nursery/garden centers and through mailings. (Appendix A). Reminder phone calls were made the day before each workshop. We had participation from 11 retail stores and nursery/garden centers, and 21 participants

1.1.3. Provide one training workshop for retail employees at participating locations that prepared participants for the on-line Beyond Pesticides training.

Retail garden centers and nursery trainings. The Project Team designed a training workshop for retail employees at participating locations which included an inventory of IPM tools, resources and aids available for retail employees (Appendix A). This training was adapted from the UC IPM program, Introduction to Pesticides for Retail Employees http://www.ipm.ucdavis.edu/IPMPROJECT/retailtraining.html. Participants learned about products they might carry for sale, as well as resources available to them to help customers, including Maintenance Gardeners, choose least toxic pesticides. Participants were provided with incentives including UC IPM landscape pest identification cards, Pests of Landscape Trees and Shrubs, and Abiotic Disorders of Landscape Plants that would support change in knowledge and behavior with Maintenance Gardener clientele as well as with consumers. Although not available for this training, a new website for retail garden centers and nurseries is now available through UC IPM at http://ipm.ucdavis.edu/RETAIL/. Included is a free newsletter, along with pest identification and support in control options
Additional resources:

- Beyond Pesticides (http://www.ipm.ucdavis.edu/IPMPROJECT/beyondpesticides.html).
- UC IPM Green Bulletin Newsletter: http://www.ipm.ucdavis.edu/greenbulletin/index.html
- UC IPM Quick Tip cards: http://www.ipm.ucdavis.edu/QT/index.html

NOTE: Since this training, UC IPM has launched a website dedicated to resources for retail home and garden centers at http://www.ipm.ucdavis.edu/RETAIL/

1.1.4. Provide incentives including UC IPM landscape pest identification cards, Pests of Landscape Trees and Shrubs, and Abiotic Disorders of Landscape Plants.

The following incentives were given to each participating retail store: hand lens, and the following UC publications: Pests of Landscape Trees and Shrubs, Abiotic Disorders of Landscape Plants, and Landscape Pest Identification Cards.

1.1.5. Design and deliver pre and post knowledge surveys.

Post workshop retrospective evaluations were collected for each of the workshops. Of the 21 attendees, the 15 respondents to evaluation reported receiving useful information and rated the workshop as good to excellent. These employees are asked pest management questions on a daily basis, and all reported feeling more confident as a result of participation and planned to implement their new knowledge immediately (See Appendix B and Appendix D-1)

Additionally, post project follow-up interviews were conducted with 17 of the 21 participants in the retail nursery training with questions seeking information on changes in knowledge, products offered at point of sale, whether customers seek out less toxic pest control alternatives, and areas for future workshops. Questions and responses are included in Appendix E.
It is important to note that 10 of the original 21 participants no longer worked either in the nursery or garden department or, in some cases, at the original location. Only seven

of the original 21 participants were available for follow-up. Impediments noted by the majority for carrying alternative products included lack of control over inventory and lack of interest on the part of the customer. They noted that "Customers seem to have a mind set of what they are looking for when they walk in" and "People seem to rely on what was recommended or worked in the past, more concerned with instant results". Additional feedback included the following comments:
"There never seems to be any follow up, a program like this will start, and then it fizzles out and nothing ever happens with it."
"Nurseries want to know what the county is getting out of this, what are the end results, what did you learn?"

Task Deliverable: Demonstrated improvement in knowledge of IPM methods by retail staff as shown by pre-and post-training survey scores.

1.2. Develop and deliver 3 IPM focused hands-on training sessions to MGs at 3 regionally diverse retail locations where MGs purchase pesticides. Trainings that address seasonally appropriate pest issues and IPM techniques will be held quarterly.

1.2.1. Inventory and adapt IPM tools, resources and aids available for MGs.

The Project Team inventoried and evaluated existing Sustainable landscape training programs that included IPM training methods for Maintenance Gardeners for materials and formats that could be adopted to meet DPR accreditation for continuing education hours. We found that sustainable landscape programs such as the Green Gardener Program have avoided significant content on pest management because of concerns regarding regulatory emphasis.
The materials found to be most effective for use with this clientele are materials that have been developed for use by Master Gardeners. Maintenance and Master Gardeners share the same urban gardening clientele. Encouraging consistency in message from Maintenance and Master Gardeners would potentially support efforts by Maintenance Gardens to reduce pesticide use in their accounts.
These resources include the UC IPM Pest Notes series. Pest Notes are science based, peer-reviewed publications about specific pests or pest management topics directed at California's home and landscape audiences. Pest Notes are available in either a web (HTML) version or a PDF version. The web versions include color photographs and links to other pages on our web site. The PDF versions have been designed specifically to print and photocopy well in black and white, and usually have line drawings instead of color photographs. The current library of Pest Notes is available at http://www.ipm.ucdavis.edu/PDF/PESTNOTES/index.html

Developed for use with the Pest Note series, UC IPM Quick Tips on pest management topics, mostly abbreviated versions of Pest Notes, are available in HTML and PDF versions. The HTML versions are one to two pages. Each PDF is printable as a single

page. Many of the Quick Tips are available in both English and Spanish. The current library of Pest Notes is available at http://www.ipm.ucdavis.edu/QT/index.html.

1.2.2. Provide quarterly training workshops for MGs at participating locations.

We developed and delivered 3 IPM focused hands-on training sessions to Maintenance Gardeners. Based on input from the Project Team, each seasonal training was held in the same week at 3 regionally diverse retail locations where Maintenance Gardeners purchase pesticides. All trainings were held from 7am to 9am and addressed seasonally appropriate topics. Trainings addressed vertebrate pest control, weed control, and pest and disease control, and were delivered in both English and Spanish. All project materials were provided in both English and Spanish.
Resource materials are noted by Training Session in Appendix A, and included IPM Quick Tip cards in Spanish and English, customized resource materials according to workshop, and sample submission forms.

We found the early morning training time was acceptable for those Maintenance Gardeners with residential clientele, since many zoning ordinances prevented them from operating before 8am. However, for Maintenance Gardeners with commercial accounts, this was not as convenient a time. Polling participants did not result in a consistently preferred time.

1.2.3. Provide incentives to participate in workshops such as sharpening stones, free lawn mower and/or shear sharpening, or IPM tools such as ant bait station and hand lens, completion certificates for attendance at all workshops.

Incentives for participation varied by workshop and included refreshments, sharpening tools, gopher trap, sprinkler adjustment key, hand lens. Incentives provided at each workshop are noted in Appendix A.

1.2.4. Provide incentives to support IPM practices including UC IPM landscape pest identification cards and bilingual Quick Tips.

Participants were provided the following incentives to support their IPM practices: UC IPM landscape pest identification cards, bilingual Quick Tip cards.

Materials were designed specifically for topics covered at each workshop. For instance, we adapted an existing ground squirrel control calendar from the UC ANR Ground Squirrel Best Management Practices website for the spring workshop. We improved the quality of the graphics as well as translating the content to Spanish, and provided a laminated, double sided English/Spanish version to participants (Appendix A). For the Summer Weeds workshop we identified nine common landscape weeds, and developed a handout with images, descriptions, and non chemical control alternatives in both English and Spanish language versions (Appendix A). Additionally, participants were provided with sample bags and information on locations where they could drop samples for identification.

1.2.5. Design and deliver pre and post knowledge surveys.

Attendees at all workshops were encouraged to complete retrospective self evaluation regarding their confidence level in the materials and concepts presented at the workshops (Appendices B, C-2, and D-2). Attendees received their incentives after completing the evaluation. Participants were asked to rate their confidence in controlling vertebrates, weeds, or insects and diseases (depending on workshop) before the workshop and then their confidence level "now that you had the training". In all cases but one, respondents reported either no change or an improvement in their confidence level. Of the 95 individual workshop evaluation responses, 21 responses indicated no change in confidence level regarding IPM practices. In general these individuals ranked themselves as confident or very confident in the material for both responses. As an example, there were 39 attendees at the Pests and Diseases workshops. Of the respondents to the post workshop survey, 100% indicated that they received useful information and 90% found the workshops good or excellent. The majority felt they could incorporate the information into their work within 6 months. In measuring their confidence in diagnosing pest and disease problems (on a scale of 1 to 5 being most confident) respondents reported a confidence level of 2.4 to 3.1 before the workshops and 3.9 to 4.0 after the workshops. Seven of the 38 respondents reported no change in confidence level as a result of participation.

At the completion of the project, post-project follow-up personal interviews were conducted by phone with 25 of the 76 individuals who participated in one or more of the training sessions. Questions sought information on changes in pest control, where pest control products were purchased, ease of finding pest control products, and how customers appreciated use of safer options. Questions and responses are included in Appendix E.

Respondents noted that they used fewer pesticides because of the training, learned about application safety (in licensing workshops) and trained their employees. One respondent noted they had not made any changes because "the training did not affect how the customers wanted the work done". Those who noted it was not easy to find pest control products mentioned language barriers, lack of softer options, not knowing where to get safer products, and not easy to ask questions sometimes as reasons.

Several of the respondents, when asked what else project staff could do to help them use safer products mentioned a need for education of homeowners and suggested bringing customers and gardeners together. All indicated a desire for future workshops.

Task Deliverable: Delivery of 9 IPM trainings from 7:00 to 8:00 am at regional retail locations during Fall of 2009, and Winter and Spring 2010.

1.3**. Engage 1 Peer Trainer at each of 3 training locations** to promote peer to peer training that capitalizes on leaders within the community.

1.3.1. Identify leaders for peer to peer training through consultation with team partners and observation at the first workshop.

The Project Team engaged 2 Peer Trainers to work with the Project Team at each of 3 training locations to promote peer to peer training that capitalizes on leaders within the community. Peer Trainers included a retail employee and a local landscape contractor who both agreed to participate at each of the 9 trainings

1.3.2. Follow up with peer trainer to participate as a leader at upcoming workshops.

The Peer Trainers were involved in the presentations of each of the workshops, and encouraged participation by their colleagues.

1.3.3. Incentives for peer trainers will include UC IPM landscape pest identification cards, Pests of Landscape Trees and Shrubs, and Abiotic Disorders of Landscape Plants.

Peer Trainers received all the same incentives as provided to attendees at the retail garden center/nursery workshop and maintenance gardener workshops.

Task Deliverable: Recruitment and training of one peer trainer at each of the regional locations.

Goal 2. Promote DPR priorities in the reduction of urban pesticide use through development of bilingual IPM continuing education materials designed for maintenance gardeners.

2.1. Evaluate pest management practices of San Luis Obispo County maintenance gardeners.

2.1.1. Determine current MG practices in consultation with local professionals.
See Appendix F.

2.1.2. Determine pesticide products used by MGs from pesticides sales at retail outlets (See Appendix F).
Additionally, review of pesticide use records by Maintenance Gardeners indicated that the materials most frequently used are herbicides. The most common are: Roundup Pro, Roundup Original, Garlon, Glyphos, Quikpro, Redeem, Remuda Full Strength, Razor Pro, Fusilade.
A variety of insecticides and fungicides are also used. The materials used most often include: Bayer Advanced 2-in 1 Systemic Rose, Malathion 55, Dursban, Omni Supreme Oil (which is also a miticide), Merit, Orthenex, Pest Fighter Year Round Spray Oil.
Fungicides: GT, WP Turf, Banner Maxx, Daconil, Green Light Rose Defense, Kocide, Safer Garden Fungicide,.
Vertebrate pest control products include: Weevilcide, Aluminum Phosphide, Wilco bait, gas cartridges. Products used for snails/slugs control are Sluggo, Deadline bullets.

2.1.3. Review DPR pesticide use report data for landscape maintenance in San Luis

Obispo County.
Pesticide use reports were reviewed prior to beginning the pilot project. However, since few Maintenance Gardeners were licensed, data was extremely limited. Additionally, most of the course attendees were newly licensed or in the process of obtaining their license. As a result, comparison data for materials used before and after project were not available. Since this is likely to be the case in many areas, this particular task deliverable will not be an effective measure of accomplishing project goals.

Task Deliverable: Before and after project data of the 3 most commonly used pesticides by MGs, that shows an increased use of IPM control methods, including reduced risk pesticides.

2.2. Inventory and evaluate existing sustainable landscape training programs that include IPM training methods for MGs for materials and formats that can be adapted to meet DPR accreditation for continuing education hours.

2.2.1. Review and adapt IPM training materials from at least 3 existing sustainable landscape or IPM training programs.
The Project Team inventoried existing IPM materials from programs such as UCIPM, Department of Pesticide Regulation's California School Integrated Pest management Program and Green Gardener Program for Santa Barbara County.

- http://www.ipm.ucdavis.edu
- http://apps.cdpr.ca.gov/schoolipm/
- http://www.greengardener.org/

The most pertinent information for IPM programs for maintenance gardeners is derived from UC IPM information for landscape professionals in coordination with materials currently being provided regarding IPM for homeowners. We found that this information allowed Maintenance Gardeners ready access to science-based information that is current and applicable to landscape situations and recommend that continuing efforts leverage work already being done with these clientele through existing University of California Efforts.

Task Deliverable: Completed inventory of IPM related materials and formats from at least 3 existing sustainable landscape programs for MGs that meet DPR accreditation requirements for continuing education hours.

2.3. Provide an IPM training manual for bilingual delivery, including tools and outreach strategies specifically designed to meet the needs of DPR continuing education requirements for maintenance gardeners.

2.3.1. Provide a training manual based on MG continuing education requirements and needs.

2.3.2. Package training program including advertising strategies, training materials, incentives and pre and post surveys in an electronic format. See Appendix A

Task Deliverable: Completed inventory of IPM related materials and formats from at least 3

existing sustainable landscape programs for MGs that meet DPR accreditation requirements for continuing education hours.

Goal 3. Model local collaborative partnerships on those that promote statewide distribution of urban IPM outreach and education for MGs.

3.1. Identify the key collaborators and required inputs for program success (Appendix G).

3.1.1. Share methods to distribute training modules for use statewide.

Task Deliverable: Organizational flow chart of key collaborators, roles and responsibilities.

3.2. Disseminate curriculum materials and program impacts to industry groups, University of California Cooperative Extension, environmental groups, government agencies, including Agricultural Commissioners statewide.

Powerpoint presentations and curriculum materials are included in Appendix H, uploaded separately from this report due to file size).

3.2.1. Presentation materials to be shared by team managers and partners to identified groups.

Project presentations were given by team members and/or sent electronically to the following groups and organizations:

- UC Integrated Pest Management UC Davis,
- Agricultural Pest Control Advisory Committee,
- So. California Deputy Agricultural Commissioners Group,
- Green Gardener Programs in Santa Barbara, Santa Cruz, Santa Clara Valley, Bay Area
- Sacramento River Friendly Landscaping,
- Cal Poly, San Luis Obispo,
- California Landscape Contractors Association,
- Department of Pesticide Regulation liaison, Thomas Babb
- Monterey County Agricultural Commissioner's Office,
- San Luis Obispo County Agricultural Commissioner's Office,
- Pesticide Regulatory Affairs Committee,
- Farm Supply Company, San Luis Obispo,
- Pesticide Applicators Professional Association,
- Ecological Center of San Luis Obispo,
- San Luis Obispo Botanic Garden,
- City of San Luis Obispo Parks Department
- Atascadero Mutual Water Company.

Task Deliverable: 20 presentations by team managers and partners.

3.3. Grant Administration

3.3.1. Schedule and meet with all team members and other interested persons as identified to review post grant acceptance at the San Luis Obispo County Agricultural Commissioner's office.

A post grant acceptance team member meeting was held on November 13, 2009 at the San Luis Obispo County Commissioner's office.

3.3.2. Schedule and meet twice per year with all team members to update and collaborate at the San Luis Obispo County Agricultural commissioner's office.

Two additional team meetings were held at the Ag Commissioner's office during the grant period.

3.3.3. Meet with DPR Grant Manager six times per year to provide updates at the San Luis Obispo County Agricultural Commissioner's office.

As per direction of the Grant Manager, updates were held by phone conference and via email reports.

3.3.4. Submit progress reports semiannually and final report in May of the final year of the grant period.

Interim reports submitted for
January – June 2010,
July – December 2010
January – June 2011
July – December 2011

3.3.5. Attend the summary seminar meeting at DPR headquarters during the final year of the grant period to provide information about grant goals, objectives and project results.

Summary seminar presentation to PMAC at Cal/EPA headquarters on November 10, 2011.

3.3.6. Schedule one summary "field" tour for invited Pest Management Advisory Committee and/or DPR staff during the final year of the grant period.

Department of Pesticide Regulation staff attended the Retail Nursery Training in San Luis Obispo on January 13, 2010.

3.3.7. Prepare and submit Alliance Invoice Report and Invoice quarterly.

Invoice reports and invoices submitted quarterly and as requested.

Task Deliverable: Successful completion of the grant.

Appendix A

Materials (Materials not hyperlinked are included in order at the end of the Appendix)

I. Retail Nursery Training: Helping Customers make Informed Pest Control Decisions

1. **Advertisement Flyer**
2. **Agenda – DPR Accreditation**
3. **Script**
4. **Survey/Course Evaluation**
5. **Evaluation Results– See Appendix B**
6. **Handouts:**
   - **A Guide for Retail Nursery Staff for Recommending Alternative Pest Control Products – UC IPM**
   - **Alternative Pest Control Tools and Products Checklist**
   - **Important Least-Toxic Pest Control for Retail Employees Information and Resources - UCIPM**
     - **Since training updated as Less Toxic Insecticides**
   - **Basic Spill Clean Up Kit for Retail Establishments**
   - **UC Pest Notes – Aphids**
   - **UC Pest Notes – Roses: Diseases and Abiotic Disorders**
   - **UC Pest Notes – Powdery Mildew on Ornamentals**
   - **UC Pest Notes – Bermuda grass**
   - **UC Pest Notes – Mallows**
   - **UC Quick Tips – IPM & Beneficial Insects**
   - **UC Quick Tips – Garden Chemicals: Safe Use & Disposal**
   - **UC Quick Tips – UC IPM Resources for Pest Managers**
   - **UC Quick Tips – Active Ingredient Imidacloprid**
   - **UC Quick Tips – Active Ingredient Glyphosate**
7. Incentives
   - Hand lens
   - Pest of Landscape Trees and Shrubs
   - UCANR Abiotic Disorders of Landscape Plants
   - **UC ANR Landscape Pest Identification Cards**

II. Maintenance Gardener Workshop: Vertebrate Control

1. **Advertisement Flyer**
2. **Agenda– DPR Accreditation**
3. **Script**
4. **Survey/Course Evaluation**
5. **Evaluation Results – See Appendix B**
6. **Handouts:**
    - **UC Quick Tips – Ground Squirrel**
    - **UC Quick Tips – Gophers**
    - **UC Quick Tips – Rats**
    - **UC Quick Tips - Peach Leaf Curl**
    - **Cinch Gopher Trap Product Overview/ How To Set A Cinch Trap - SCAN**
7. **Incentives:**
    - **Cinch gopher trap**
    - **Hand lens**

III. Maintenance Gardener Workshop – Weed Control In Lawns

1. **Advertisement Flyer**
2. **Agenda – DPR Accreditation**
3. **Script - NA**
4. **Survey/Course Evaluation**
5. **Evaluation Results - – See Appendix B**
6. **Handouts:**
    - **UC Quick Tips – Weeds in Lawns**
    - **UC Quick Tips – Weeds in Landscapes**
    - **UC Quick Tips – Weed Control Using Herbicides**
    - **UC Quick Tips – Lawn Insects**
    - **Common Weeds in Lawns – San Luis Obispo**
    - **Common Turfgrass Species**
    - **UC Coop. Ext. Sample Submission Form**
7. **Incentives:**
    - **Landscape Pest Identification Cards**
    - **Irrigation valve adjustment key**

IV. Maintenance Gardener Workshop – Pest and Disease Control

1. **Advertisement Flyer**
2. **Agenda – DPR Accreditation**
3. **Script**
4. **Survey/Course Evaluation**
5. **Evaluation Results - – See Appendix B**
6. **Handouts:**
    - **UC Quick Tips – Beneficial Predators**
    - **UC Quick Tips – Ants**
    - **UC Quick Tips – Aphids**
    - **UC Quick Tips – Giant Whitefly**
    - **UC ANR Landscape Pest Identification Cards**
    - **UC Coop. Ext. Sample Submission Form**
7. **Incentives:**
    a. **Hand lens**
    b. **Corona sharpening tool with 3oz. WD-40**
    c. **Tanglefoot ant barrier**
    d. **T-shirts and hats donated by Farm Supply**

Retail Nursery Training On:

Helping Customers Make Informed Pest Control Decisions

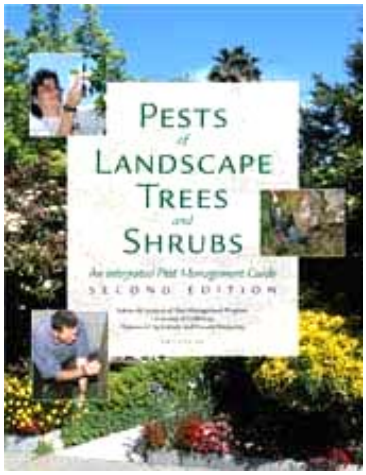
This workshop is designed to provide training to retail nursery employees who sell pesticides to Maintenance Gardeners. Attendees will learn the least toxic pesticide options, alternatives to pesticides and the resources available to help their customers make environmentally sound pest control choices.

North County Training-
January 12th, 2010 (9:00 – 11:00 A.M.)
Sheriff's conference room @ 356 N. Main St., Templeton
Please do not park in front of building

SLO Area Training-
January 13th, 2010 (9:00 – 11:00 A.M.)
Farm Supply @ 224 Tank Farm Rd, SLO

South County Training-
January 14th, 2010 (9:00 – 11:00 A.M.)
Arroyo Grande Ag. Department @ 810 W. Branch St, Arroyo Grande

Every nursery that attends will receive the following items:



Please pre-register with the number of employees and which training they plan on attending to:

Laura Hebert- (805) 781-5917, lhebert@co.slo.ca.us, or fax to (805) 781-1035.

Integrated Pest Management Continuing Education for Maintenance Gardeners

Part I RETAIL NURSERY TRAINING:

HELPING CUSTOMERS MAKE INFORMED PEST CONTROL DECISIONS

Presented by the Integrated Pest Management Alliance Grant awarded by the California Department of Pesticide Regulation

SIGN IN

INTRODUCTIONS

PROJECT DESCRIPTION

INTEGRATED PEST MANAGEMENT PRESENTATION

HANDS ON ACTIVITIES

PRODUCT LABELS

SAFETY

SURVEY / QUESTIONS

IPM Education for Retail Employees Who Sell Pesticides
SCRIPT
How to Help Customers find the Least toxic Solutions

The goal of this course is to help you give answers that are environmentally friendly and provide the best long-term management of pests. You'll learn key steps for solving customer problems, be able to identify the main pest groups, and learn about pest management practices, especially the importance of prevention. Examples of IPM programs for key pests that involve products and tools sold in stores.

Setting the stage - you can help customers by letting them know about other ways to control pests

What are the options?
Pesticides aren't the only option for solving pest problems. Other practices include
using pest-resistant plants,
mulches for weed control, or
keeping pests out of buildings with caulk - exclusion.

Often the best results are achieved when several nonchemical tools are used together to prevent problems. Integrated pest management (or IPM) provides a system for combining or integrating several practices to get better control than any one can give. In an IPM program, pesticides are used as a last resort after everything else has failed. If pesticides are needed, choose least-toxic ones, and apply them in ways to minimize risks to people, pets, and the environment.

Help customers solve problems
The first step in helping customers troubleshoot pest problems is to
find the cause by accurately identifying pests and their damage. Ask customers when and where problems are occurring and how extensive the damage is. Try to find out what is causing pests to invade so that you can suggest practical ways to make the home or garden less pest-friendly. These may include
modifying watering practices (timers),
cleaning up debris, or
sealing up places where pests enter buildings. Often, the best answer may be to combine two or more methods. If pesticides are necessary, identify and recommend the safest, most effective product. Using this sort of integrated, environmentally friendly approach is the key to IPM.

Step 1: Identify the pest
Before you can recommend a solution, you need to know what is causing the problem. You must accurately identify the pest and know some basic information about its biology and life cycle, such as when it is active, where it lives, or what food it prefers. Identifying the plant being attacked (or the host plant) can also be important in identifying the pest and choosing effective solutions.

There are four main groups of pests found in homes, gardens, and landscapes: invertebrates, or animals without backbones such as insects, mites, and slugs and snails; weeds,
plant diseases, and
vertebrates, such as rodents and other animals with backbones.

Invertebrates: insects, mites, slugs and snails

Insects and other invertebrates cause a wide variety of damage symptoms on plants, but they can also invade homes. Although many insects and mites are pests, others can be beneficial, so it is important to know which is which.

Insect pests outside in the landscape or garden

Some examples of common insect pests that occur outdoors are ants, aphids, and caterpillars. Snails and slugs are mollusks that are common garden pests. Often you can identify the type of pest by the type of damage it causes. For example chewed leaves or fruit may point to insects with chewing mouthparts such as caterpillars. Slugs and snails chew holes in leaves, flowers, and fruit. Cracked bark and tunneling into trunks and limbs can indicate borers. Aphids and similar insects have sucking mouthparts and produce sticky honeydew. Curled and distorted leaves and sticky plants with sooty mold can also be signs of these pests.

Insect pests inside the home

Several insect pests are problems indoors.
Ants invade searching for food.
Fleas can be brought in on pets.
Pantry pests are moths and beetles such as the red flour beetle, sawtoothed grain beetle, and Indianmeal moth that can get into stored food such as grains, cereals, or pastas.
Clothes moths can chew tiny holes in clothing, carpets, rugs, and upholstered furniture.

Weeds

Weeds are unwanted plants that grow in gardens, landscapes, and lawns, often crowding out desirable plants. Weeds are commonly classified as broadleaves, grasses, or sedges. They are generally grouped as annuals, which complete their life cycle in just one season, or perennials, which survive for more than one season.

Annual weeds spread by seed and are fairly easy to manage. Most serious weed problems are perennials. Perennials are harder to remove and manage because their roots grow deeper and they can also survive as modified stems such as rhizomes, stolons, or tubers. Knowing what type or species of weed is invading gardens and landscapes is crucial for choosing the most effective way to manage it long term. Weeds are most easily identified when they are grown and have flowers, but they are best managed when they are small seedlings.

Plant diseases

Fungi, bacteria, and viruses are pathogens that infect plants, causing disease when conditions are right. Certain practices such as overwatering, using overhead sprinklers, pruning improperly, planting disease-prone plants, or planting in a poor location can increase the chances of disease. Some common plant diseases are powdery mildew, root rot, and rust.

Vertebrates

Pocket gophers, squirrels, rats, mice, rabbits, and birds are among the most common vertebrate pests in homes, gardens, and landscapes. Often residents never see the culprit, only the damage it leaves behind.

Vertebrate pests will eat a variety of garden plants such as vegetables, fruit, berries, and young shrubs. They may even gnaw and damage bark of young trees. Squirrels and gophers often damage sprinkler heads and plastic water lines. Gopher, mole, and squirrel mounds can interfere with mowing equipment. Gopher mounds are crescent-shaped and plugged. Mole mounds have circular margins, and squirrel mounds have an open entrance to the burrow.

Is it really a pest?

Recognize that pests aren't always to blame for problems in the garden or landscape. Some plant damage is the result of nonliving causes such as air pollution, frost, sunburn, pesticide damage, nutrient problems, improper watering, or pruning. This type of injury is called an abiotic, or nonliving, disorder. When a customer comes into the store describing an apparent pest problem, try to determine if the damage is due to pests rather than some other cause. It is important to distinguish pest problems from abiotic injury so that you can recommend the best management solution. Pesticides or other pest control tools won't solve abiotic-caused problems.

Many abiotic disorders have characteristic patterns or discoloration. Ask the customer some key questions. Have they recently applied fertilizer or pesticides? Have there been changes in irrigation? Do all the sprinklers work properly? Are there any patterns? When did you first notice damage – after a frost, after a heat wave? Do you have a dog? Asking these questions may help the customer realize a recent practice, weather pattern, or nutrient imbalance could be at fault.

Where to go for help

Obviously you can't be expected to identify every pest and make management recommendations off the top of your head. However, there are many resources that can help you identify problems and determine the best solution. An important resource is the university Cooperative Extension office in your state or county. You can get a list of cooperative extension offices at the national pesticide information center web site. In California, the University of California IPM web site has a large home and garden section with information about identifying and controlling pests and disorders for hundreds of plants and household pests. There are tools for identifying ants and weeds, as well as photo galleries showing weeds and beneficial insects. UC IPM also has reference books that include common pests on hundreds of host plants. This information is useful for gardeners across North America. Retail staff can also take pest problems to trained nursery professionals or to a local Cooperative Extension office where advisors or Master Gardeners can help with pest diagnosis.

Step 2: Find out when and where pests are occurring

After you have identified the pest, the second step in helping customers solve pest problems is to find out when and where problems are occurring and how extensive the damage is. The time

when the customer notices a problem may not be the best time to treat. For example, you are likely to have gardeners coming into the store with samples of peach leaf curl from their peach or nectarine trees in the early spring. But there is little they can do to manage peach leaf curl until the next winter when they can apply dormant sprays. Sometimes, the pest may be unlikely to cause serious damage, as in the case of some caterpillars on large trees. Sometimes the customer will see damage, but the insect pest that caused it is long gone so treatment would be a waste of money. Emphasize to the customer that sometimes no action is needed.

Encourage customers to regularly look around their gardens and landscapes for signs of problems such as slug and snail or ant trails, weeds, or vertebrate burrows and droppings. Explain that they can inspect tree limbs, trunks, and both the upper and underneath sides of plant leaves for insects and signs of disease or other disorders. They can also look for natural enemies that may be keeping pests under control. Show them various tools in your store that may help when looking for pests – a flashlight to help see in dark places in the house and a magnifier or hand lens for viewing small insects or signs of disease. Direct customers to traps that can help detect pests such as roaches or whiteflies. Pheromone traps are available for pantry pests and other moths. Pheromone traps are baited with a chemical that mimics the scent of a pest to attract other pests of the same species. Stress to customers that it is best to detect pest problems early so they can be managed before they get out of hand.

Step 3: Change indoor conditions that cause pests to invade

A primary goal of IPM is to prevent pests from becoming established in the first place. However, most customers don't come in to ask how to prevent problems. Usually they have a serious problem that they want to control NOW. Once you know what the pest problem is and where it occurs, you can help the customer identify conditions that favor the pest and suggest changes that can help prevent future infestations. For indoor pests, suggest to customers that they can clean up spills, remove or seal up foods, and fix leaky pipes. To keep pests such as ants from coming indoors, they can use caulk to seal cracks in walls, baseboards, or under cabinets. They can install and repair window screens and apply weather stripping to keep other pests out.

Change outdoor conditions that favor pests

If customers are having trouble with pests entering their homes, encourage them to reduce pest problems by changing conditions outdoors. Suggest that customers trim tree limbs that are touching buildings, clean up debris, and remove ivy, overgrown shrubs, or ground covers that provide nesting areas for pests such as roof rats, roaches, slugs and snails, and ants. For yellowjackets and fly infestations, tell customers to keep lids on outdoor garbage cans and rinse them out occasionally. Get rid of breeding areas for flies such as dog feces or decomposing vegetation.

If weeds are invading bare spaces in planting beds, suggest that customers plant more plants, install mulch, or switch from overhead to drip irrigation. If water remains in puddles after irrigating, they can reduce watering and improve drainage.

Step 4: Combine methods to manage pest problems

Although most customers are looking for a single quick solution to their pest problems, a combination of methods may be more effective over the long term. Your store sells many

products that can be helpful. For instance, if your customer is a gardener planting a new area or changing an existing landscape, you can help them identify conditions that may favor pests and give them ideas on how to make their garden more pest resistant. The preferred methods in an IPM program are those that provide long-term management by making conditions less favorable for pests. These include preventive practices such as selecting resistant plants, irrigating or fertilizing properly, or installing barriers to pests such as mulches, screens, or sealing up entryways. Nonchemical control methods such as traps, cultivation, pruning out infestations, or relying on beneficial insects, can also be important. Preventive and nonchemical methods are often categorized under the headings of cultural control, physical or mechanical control, or biological control. Pesticides, or chemical controls, are also used in IPM programs when other methods aren't effective.

Select the right plants

One of the best types of advice you can give your customers is to recommend tolerant plants that have few pest problems. Ask about how much sun, shade, and space the customer has and the type of drainage or irrigation, and choose varieties that best fit their situation. It may be helpful to keep on hand a list of pest tolerant plants that are known to have few problems in your area as well as a list of key pests that attack common plants. Many garden plants such as crape myrtle, rose, and tomato are available in varieties that are less likely to be damaged by diseases or other pests. Other plants, including many native plants, just naturally have few problems. Advise customers to avoid plants that they have had problems with in the past.

Irrigate and fertilize properly

Poor irrigation and fertilizer practices are among the most common reasons plants develop problems. Overwatering often leads to waterlogged soil, causing root rots or other diseases and weed invasions. Underwatering can lead to plant stress that may cause secondary problems such as insect feeding. Overfertilizing can stimulate too much growth, leading to outbreaks of sucking insects like aphids. Underfertilizing could cause plants to lack important nutrients, making them less competitive with weeds.

Encourage customers to use irrigation timers and to time watering to make it most effective. The morning is the best time to irrigate. Watering at night could increase the chance for disease to develop. Overhead sprinkling can be linked to some diseases. Drip irrigation may be a better choice for reducing disease in woody plants. It also helps conserve water and can help reduce weed growth and some insect pests. Soaker hoses are another option. Keep a display of water efficient irrigation tools in your store.

Fertilize properly

When selling fertilizer, stress to customers not to use too much. Most established ornamental trees do not require fertilizing. For lawns, overfertilizing can favor leaf growth over root growth, making them more susceptible to disease. Make sure customers have a well-calibrated spreader for their lawn and sweep granules that get on sidewalks back on to lawns. Excess fertilizer can get washed into storm drains and pollute waterways. Encourage customers to use slow release formulations, preferably organic fertilizers, and avoid products that combine fertilizers with herbicides or insecticides. The best time to fertilize is often not the most effective time to control most weeds with an herbicide.

Prune plants correctly

Pruning can be used to reduce infestations of some insects and diseases, such as borers, aphids, or fire blight. However, if you use the wrong pruning tools, you can injure trees, making them more susceptible to disease. Advise customers to use the right type of pruners for the job. Bypass pruners should be used only for small branches; bypass loppers should be used for larger ones. The largest branches should be pruned with a pruning saw. Keep pruners sharp. When pruning diseased trees, disinfect tools with a solution of 1 part bleach to 9 parts water. Do not recommend coatings for pruning cuts; these may increase disease.

Get those weeds out

Hoes and other weed removal tools are the best way to control established weeds in many garden situations. Familiarize yourself with the various tools in your store so that you are prepared to recommend the right product for the job. It is important to remove weeds when they are small and pull out the root. Hand cultivators are used to loosen soil around larger weeds and cultivate seedlings in small areas. Weed knives can be used to remove weeds in cracks or in lawns. Garden hoes and push-pull or hula hoes can be used to remove small annual weeds. Garden hoes use a chopping motion to cut weeds at the soil line. Push-pull hoes are moved back and forth along the ground to destroy weeds. A weeding hoe cuts weeds with a pointed side and then pulls weeds out with a two-pronged side. String trimmers can break older weeds or small woody weeds and are useful for customers who have large areas to cover. Tell customers that they should consider installing mulches where possible after weeding, so they won't have to weed so often.

Mow properly

If you sell lawn mowers, encourage customers to purchase ones that are easily adjustable and to consider a mulching model. Mowing properly is an important part of pest management. Most lawns should be kept between 1 to 3 inches high, depending on the type of grass planted. Only 1/3 of the height should be removed at a time. Mowing lawns too short can weaken the lawn, making it susceptible to weeds, disease, or insects. Keep the mower blades sharp. Proper mowing, along with good irrigation and fertilizing practices, will keep the lawn vigorous and competitive with weeds and other pests. For more information on mowing, direct customers to the Healthy Lawns section on the UC IPM web site.

Prevent weeds with mulch

Several types of mulches are available to help prevent problems in gardens and landscapes. Familiarize yourself with the benefits of each type. Aluminum mulches, or reflective mulches, can be applied in vegetable gardens to repel aphids and whiteflies and prevent spread of some viruses. Aluminum mulches may be hard to get a hold of. If your store doesn't stock it, you can find it online. For managing weeds, there are rock mulches, paper mulches, organic mulches such as bark chips, wood chips, or compost, and synthetic mulches such as fabrics. Rock mulches look nice but are difficult to weed when weeds do get in. Organic mulches are good weed barriers but must be applied in a layer deep enough to keep light from reaching the soil. They should also be kept away from the base of woody trees and shrubs. Remind customers that they will need to reapply mulch at least once or twice a year to keep the proper depth. In more

permanent areas, suggest that customers apply organic mulches over a fabric barrier. Some people also use newspapers or corrugated cardboard mulches.

Get rid of pests with traps and barriers

Your store probably carries a variety of traps and barriers that can be used to manage or repel many pests. Make customers aware of these items when they come in asking for pest management advice. Traps are available for vertebrates such as rats, mice, and gophers. Also, specialized traps are available for many invertebrates – sticky traps for whiteflies, traps with pheromones for attracting pests such as yellow jackets and moths, and other types of traps for slugs and snails. Sticky barriers such as tanglefoot can be applied to tree trunks to prevent ants from crawling up. Copper barriers applied around planter boxes or tree trunks can repel slugs and snails. Row covers can be used in beds to protect young vegetables or flowers from pest damage.

Hose off pests

If a customer comes in asking how to get rid of insect pests such as aphids, whiteflies, or spider mites, sometimes the best suggestion is to tell them to knock the pests off with a strong spray of water. Direct customers to the irrigation part of your store and recommend a good-quality adjustable nozzle. There are specialized nozzles sold specifically for washing pests off. Hosing off may have to be done daily at first if pests come back.

Manage pests naturally

Biological control is the use of living natural enemies to manage pests. All pest types, including weeds and plant diseases, have natural enemies, but in a garden and landscape situation, biological control is most often applied against insects and mites. There are three main types of insect natural enemies: predators, parasites, and pathogens. Predators, such as lady beetles or lacewings, attack and feed on many kinds of insect prey. Parasites, such as tiny wasps or flies, are small and live and feed in a larger host for much of their lives. Pathogens, such as viruses, fungi, and bacteria can cause disease and kill certain insects such as aphids or caterpillars. Some stores sell ladybugs, lacewings, and insect-eating nematodes for controlling lawn grubs and certain moths that bore in trees. They can be somewhat effective if properly applied. However, the most effective natural enemies are the ones that occur naturally in gardens. Hundreds of species are common in home landscapes and frequently keep pests in check. Help gardeners learn to recognize and protect them. For more information, visit the natural enemies page on the UCIPM web site or see the Natural Enemies Handbook.

Common natural enemies

Here are some of the most common natural enemies: The convergent lady beetle, green lacewing, syrphid fly, soldier beetle, spiders, predatory mites, and parasitic wasps. Because parasitic wasps are so small, you'll more likely see evidence of their activity rather than the parasite itself. Parasitized aphids form mummies. Note the exit holes in these parasitized aphids and scale insects from which adult parasites emerged.

Enhance natural enemy activity

If your customer is interested in using natural enemies, give them some tips for encouraging the ones that are in their yards already. Tell them to stay away from broad-spectrum pesticides such as permethrin, bifenthrin, and other pyrethroids, organophosphates such as malathion, and the

carbamate carbaryl sold under the brand name Sevin. Applications of these pesticides leave toxic residues that will kill natural enemies for weeks. If insecticides are needed, suggest that customers use less-toxic products such as insecticidal soaps or oils. Recommend that customers manage ants with baits or sticky barriers. Ants often protect pests such as aphids, soft scales, and whiteflies from natural enemies. Some gardeners may be interested in plants that attract and provide food for predators and parasites. Flowering plants that have a long bloom season and produce nectar are best. Some commonly used plants include cosmos, alyssum, coreopsis, yarrow, and buckwheat.

Using pesticides in an IPM program

Pesticides can be part of an IPM program and used in combination with other management methods. However, they should be used as a last resort after other methods fail. For the customer in the clip on the previous screen, you can help him choose an herbicide that can kill the specific weed in his lawn. But also make suggestions about how he can protect the lawn from future weed invasions with practices such as overseeding with a competitive turf species, and fertilizing, mowing, and watering properly. This is an IPM approach. Remember, there are many types of pesticides and many are less-toxic products that are compatible with IPM programs and safe for the environment. Other pesticides are packaged in bait stations or can be applied in a manner that keeps them from posing serious risks. For more information on pesticide types, reading labels, and safe use, refer to the online course Introduction to Pesticides for Retail Employees.

Screen 40: Summing it up

Although most customers want a quick solution to pest problems, many are aware of the hazards that pesticides can pose to their families or to the environment and want to avoid using them unnecessarily. As a retail employee, you can play an important role in directing customers to safer nonchemical or less toxic methods or tools. Here are a few things to remember: The first step in this process is to correctly ID the pest or damage and have an idea of the pest's biology. Search the UC IPM web site and publications for help identifying pests and management options. Become familiar with the types of management practices that are effective against common pest groups. Also be aware of the products that you sell in your store and know how to use them. Remember that for most pests, the best management will be achieved by using a combination of methods and tools to prevent problems in the first place. Understand that pesticides can be used in an IPM program. But they should be recommended only when absolutely necessary and least-toxic materials should be used.

Examples of IPM programs

The following screens show examples of IPM programs for key home and garden pests such as snails and slugs, weeds, aphids, mice, and ants.

IPM for snails and slugs

Snails and slugs are common garden and landscape pests. You don't always see them because they are active at night and early morning, but they can be identified by the damage they cause. Ask customers where damage is occurring. They can look for holes in leaves, flowers, and fruit, and for silvery slime trails or feces left behind. If customers have snail and slug problems,

identify conditions that encourage them such as tender plants, areas of shelter, and lots of moisture.
Combine methods to manage snails and slugs. Modify the environment by removing hiding places, switching from overhead to drip irrigation, and planting snail-proof plants – for example -- begonias, cranesbill geraniums, rosemary or lavender. Hand-picking slugs and snails or trapping with old flowerpots or boards or commercial snail or slug traps can help reduce numbers. Install copper barriers around tree trunks and planting beds to prevent entry to these areas. As a last resort, these methods can be combined with a baiting program. Iron phosphate baits are much safer for the environment and to pets than metaldehyde baits. Metaldehyde baits are toxic to dogs. Baits alone are unlikely to give complete control.

IPM for weeds
Many weeds infest gardens, landscapes, and lawns. Identify the weed species and their stage of growth so you can determine the best management strategy. Use the photos and other tools on the UCIPM web site to help you identify them. Ask the customer when and where pests are occurring and how extensive the problem is. Help customers identify conditions that may be favoring their growth such as unplanted areas, poor irrigation, an unhealthy lawn, or nearby sources of weed seeds.

Combine methods to manage weeds. The primary way to remove existing weed infestations in planting beds is hand-weeding using various cultivation tools. Occasionally herbicides may be needed for serious infestations of some perennial weeds. For lawns, weeds can be dug out, or herbicides can be applied. Often a very weedy lawn needs to be renovated and replanted. Encourage your customers to take a long-term view and modify their landscapes to prevent future weed invasions. Show them the various types of mulches you have in stock and encourage them to apply them in bare areas. They may also want to consider planting ground covers to cover bare soil. If weeds are a problem in lawns, make sure their turfgrass species is a good one for the area and for the amount of shade in their landscape, and check to see that they are fertilizing, mowing, and watering properly. If weeds are related to irrigation, introduce customers to different irrigation options. Long-term management of weeds requires the integration of many practices.

IPM for aphids
Many species of aphids infest trees, shrubs, and vegetables. Confirm that damage is due to aphids and ask customers where pests are occurring. They can look for curled leaves or leaves covered with sticky honeydew or sooty mold. They can also look for aphids on stems and leaves and on new growth. But advise customers that although damage may not look very good, aphids don't usually cause long-term damage or death to plants and can often be tolerated. Help customers identify conditions that may be causing aphid populations to thrive, such as aphid-prone plants, recent pesticide sprays that have killed natural enemies, overfertilizing that can stimulate new growth, or ant colonies that protect aphids from natural enemies.

Combine methods to manage aphids. Reduce infestations by planting plants that don't have aphid problems, avoiding pesticides that kill natural enemies, not overfertilizing, and managing ants with sticky barriers and baits. Prune out infested leaves and branches or knock aphids off with a strong spray of water. Check to see if natural enemies such as ladybugs and parasitic

wasps are active and take measures to encourage them. If needed, these methods can be combined with a less-toxic pesticide such as an insecticidal soap or oil.

IPM for mice or rats

Rats and mice can be quite a nuisance around homes and gardens. Even though you may not see them, you can recognize their presence by the damage they cause. Your customers can identify these pests and find out when and where they are occurring by looking for droppings, hollowed out fruit, or chewing damage on packages, wooden objects, and wires. Mice are more common indoors than rats. Help customers identify conditions around their home that favor rat and mouse infestations, such as dense vegetation and gaps and cracks around buildings.

Combine methods to manage rats and mice. Modify the environment to keep them out. Reduce hiding places outdoors by removing dense vegetation near buildings. Seal all cracks and gaps around buildings, doors and windows. Install screens over larger holes or stuff them with copper wool. Eliminate food sources such as open bird feeders, uncovered trashcans, pet food, and even unharvested fruit on trees. You can physically remove rats and mice by trapping them. There are baits available that can be used in combination with these other methods, but they should not be used indoors because killed rodents will leave an odor inside. If you use baits outdoors, use them only in tamper-proof stations and keep them away from children and pets.

IPM for ants

Ants outdoors can generally be tolerated, but they become a nuisance when they protect honeydew-producing insects on trees and shrubs and when they come indoors, invading kitchens, bathrooms, and other areas in the home. Once you have identified the pest and know where ants are occurring, help customers identify the conditions around their homes, such as food and water sources or nesting sites, that are causing ants to thrive and invade.

Combine methods to manage ants. Change the environment by cleaning up spills, removing and sealing up foods, cleaning up debris, trimming back trees and shrubs as not to create a bridge from plants to a building, and caulking cracks. Apply sticky barriers around trees. Indoors, sponge invading ants with soapy water. Use baits in combination with the other methods to manage the colony. Reducing the population outdoors in the spring will reduce the chance of indoor infestations.

Retail Sales Training Survey

1.) On a scale of 1-5, 1 being not at all confident, 5 being very confident, how would you have described your confidence in answering customer's questions about controlling pests before the training you received today?

1 2 3 4 5

2.) On a scale of 1-5, 1 being not at all confident, 5 being the very confident, how would you, (after this training), describe your confidence in recommending an alternative to pesticides, or a less toxic pesticide option?

1 2 3 4 5

3.) How often do customers ask questions about pest control options?

Never
Once a month
Once a week
Every day
Multiple times a day

4.) What pests do customers ask about most often? (Circle all that apply)

Weeds
Insects
Vertebrates
Plant Diseases

5.) Of the answers above, is there any one pest in particular? (Weeds-Oxalis, Mustard, Grasses, etc.)

6.) Do you feel your store carries adequate products to provide customers with alternatives to pesticides (e.g. Mulch for weed suppression, etc.)?

Yes No

7.) For which pest category does your business have the most limited alternative pest control products?

Weeds
Insects
Vertebrates
Plant Diseases

8.) After this training do you feel more confident in providing informed pest control advice?

Yes No

9.) When do you feel you could implement information from this training?

Tomorrow
This month
Need more information

10.) Who makes product choices for your store? (Circle all that apply)

I do
Department Manager does
Store Manager does
Corporate Office does
I do not know

11.) Was the information from this training useful?
Yes No

12.) How would you rate this training overall?
Poor
Fair
Good

13.) What topics could we add to this training?

14.) Any additional information that would be helpful for us to teach the public, or people in the landscape profession?

15.) Education- (Circle the highest level achieved)
High School
Trade School
Some College
Bachelors
Post Graduate

16.) How long have you been in the nursery business?
< 1 year
1-5 years
6-10 years
> 11 years

Moving Beyond Pesticides: An IPM Approach

How to help customers who want least-toxic solutions:

1. Stress the importance of correctly identifying pests or other causes of damage and understanding the pest's biology.

2. Consult or refer to the resources below for help with identification and management.

3. Become familiar with general types of management practices for common pest groups. Help customers prevent problems by choosing resistant varieties, installing mulch, fertilizing, irrigating and mowing properly, and building pests out.

4. Learn about the non-chemical control tools and less-toxic pesticide products that you sell, and know how to use them effectively.

5. Explain how several tools or products can be used together to achieve more reliable control and protect the environment.

6. If pesticides are necessary, help customers choose least-toxic products.

Key resources:

Find your county cooperative extension office

- National Pesticide Information Center (http://npic.orst.edu/countyext.htm)
- University of California Cooperative Extension (http://ucanr.org/ce.cfm)

Pest identification and management methods

- UC Statewide IPM Program – Home and garden pest information (www.ipm.ucdavis.edu/PMG/menu.homegarden.html)

Information about pesticide products and safety

- California Department of Pesticide Regulation (www.cdpr.ca.gov/)
- National Pesticide Information Center (http://npic.orst.edu/gen.htm)
- EXTOXNET (http://extoxnet.orst.edu/)

Pesticide disposal

- Find your nearest hazardous waste district (1-800-CLEANUP)

Spanish resources

- UC Statewide IPM Program – Quick solutions to consumer pest problems (www.ipm.ucdavis.edu/QT/qtindexsp.html)
- California Department of Pesticide Regulation – Consumer Fact Sheets (www.cdpr.ca.gov/docs/dept/factshts/factspanish.htm)

Moving Beyond Pesticides: An IPM Approach

See the home & garden main menu for active links to pest information: www.ipm.ucdavis.edu/PMG/menu.homegarden.html

UC IPM Home
Search

For more information, see this online resource:

Touch-Screen Pest Management Kiosks

How to Manage Pests
Home & garden
Agriculture
Natural environments
Exotic & invasive
Weather data & products
Degree-days
Interactive tools & models

Identification Galleries
Natural enemies
Weeds

Educational Resources
Publications & more
Workshops and events
Training programs
Pesticide information

Research and IPM
Grants programs
Funded-project results

- What's new
- In the news
- Announcements
- Site index
- Help
- Acknowledgments
- UC ANR: more topics

How to Manage Pests
Pests in Homes, Gardens, Landscapes, and Turf

University of California's official guidelines for pest monitoring techniques, pesticides, and nonpesticide alternatives for managing pests, including information from Pest Notes and The UC Guide to Solving Garden and Landscape Problems. | More | Acknowledgments |

| Pest Notes | Quick Tips | Quick Tips en español | Recent updates | What is IPM? |

Search home and garden: Go Take the tour**

Pests in the home

- Household—pests of homes, structures, people and pets

Pests in gardens and landscapes

Choose a plant to find the most likely source of your pest problem

- Flowers
- Fruit trees, nuts, berries, and grapevines
- Lawns and turf—including comprehensive lawn guide
- Trees and shrubs—including roses and other ornamentals
- Vegetables and melons

***Some common pests and methods* (Pest Notes library)**

- Birds, mammals, and reptiles—vertebrate pests
- Insects, mites, mollusks, and nematodes—invertebrate pests
- Plant diseases
- Weeds
- Management methods including pesticides and biological control

Pesticide information

- Hiring a pest control company
- Pesticides: safe and effective use
- Pesticides and water quality
- Information related to specific pesticides
- Other resources

More information (What Is IPM?)

- Identification helpers—including natural enemies and weed photo galleries
- Related publications
- Pest management kiosk locations
- UC Statewide Master Gardener Program—find your local Master Gardener program
- Exotic and invasive pests
- Quick tips in PDF, en español

**Requires Adobe Flash Player.

Alternative Pest Control Tools and Products

Direct Controls to kill or remove the pest

Weed Control	Insect Control	Disease Control	Vertebrates
rototillers	pheromone mating disrupt ants	pruning equipment	gopher traps
shredders	pheromone traps		gopher cages
weeding tools	sticky traps		
propane burners	insect attacking nematodes		
weed trimmers	predatory insects		
weeder geese and chickens	parasitoids		

Indirect Controls - control the pest s through exclusion (sun light or access) or promote plant health

mulches	diatomaceous earth	irrigation parts and timers	bird netting
compost	copper strips	turf aerators	barn owl boxes
irrigation parts	Tangle foot	antitranspirants	hawk perches
row covers	fertilizers	plant nutrient sources	bat houses
asphalt crack filler	botanical repellants	disease resistant plants	
dense ground cover	plants that attract predatory insects	appropriate plant choices	
weed control fabric	appropriate plant choces		
	pest resistant plants		

BASIC SPILL CLEAN UP KIT FOR RETAIL ESTABLISHMENTS

1. Nirtrile gloves, disposable or reusable.
2. Cat litter (absorbent clay type).
3. Small shovel, broom, dustpan, and a five gallon plastic bucket with a lid.
4. Paper towels and a cleaning agent like household ammonia or bleach.

Always keep chemicals off of your skin, even if the product label says it's organic. Wear chemical resistant gloves and wash your hands thoroughly with soap and water after handling chemicals. Ventilate the area and keep customers away from the spill.

Follow the label on the chemical container for disposal of the container and the spilled product. For most homeowner products the cleaned up portion can go in the dumpster. Do not flush it down the sink or the storm drain.

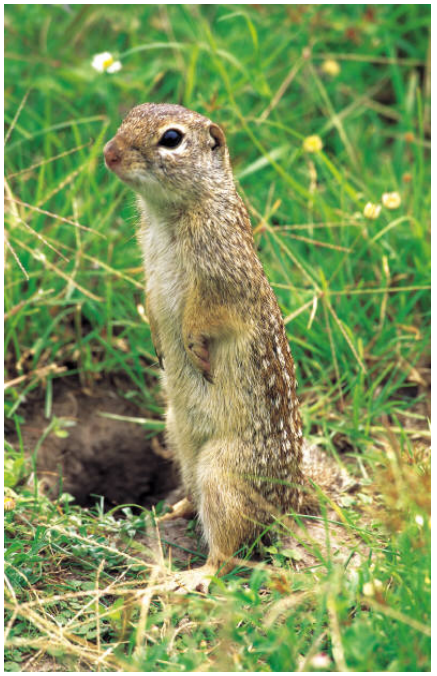
Household ammonia or bleach will clean up the remaining odor and stain. Only use one, do not mix them!

Pest Control for Maintenance Gardener

1 Hour of Continuing Credit Available

Dates and Locations

Tuesday ***March 16th***, 2010- 7-8:30 A.M.
Paso Robles- Farm Supply Company
1108 Paso Robles St., PR
Wednesday ***March 17th***, 2010- 7-8:30 A.M.
San Luis Obispo- Farm Supply Company
224 Tank Farm Rd., SLO
Thursday ***March 18th***, 2010- 7-8:30 A.M.
Arroyo Grande- Farm Supply Company
1079 El Camino Real, AG



Agenda Items

- **Gopher, Mole, and Vole Pest Control**
- **Spring Weed Management**
- **Plant Diseases to Watch For**

Find out about *incentives* when you RSVP (805) 781-1117

PEST CONTROL FOR MAINTENANCE GARDENER

1 HOUR OF CONTINUING CREDIT AVAILABLE

Dates and Locations

Tuesday ***March 16th***, 2010- 7-8:30 A.M.
Paso Robles- Farm Supply Company
1108 Paso Robles St., PR
Wednesday ***March 17th***, 2010- 7-8:30 A.M.
San Luis Obispo- Farm Supply Company
224 Tank Farm Rd., SLO
Thursday ***March 18th***, 2010- 7-8:30 A.M.
Arroyo Grande- Farm Supply Company
1079 El Camino Real, AG

Agenda Items

- Gopher, Mole, and Vole Pest Control
- Spring Weed Management
- Plant Diseases to Watch For

Bring in insect, disease, or weed samples to have identified!

Find out about *incentives* when you RSVP (805) 781-1117

CONTROL DE PLAGAS Y ENFERMEDADES PARA JARDINEROS DE MANTENIMIENTO

1 HORA DE CREDITO DE EDUCACION CONTINUA

Fechas y Lugares

Martes ***Marzo 16th***, 2010- 7-8:30 A.M.
Paso Robles- Farm Supply Company
1108 Paso Robles St., PR
Miércoles ***Marzo 17th***, 2010- 7-8:30 A.M.
San Luis Obispo- Farm Supply Company
224 Tank Farm Rd., SLO
Jueves ***Marzo 18th***, 2010- 7-8:30 A.M.
Arroyo Grande- Farm Supply Company
1079 El Camino Real, AG

Temas del Programa:

- Control de topos y otros roedores perjudiciales
- Manejo de malas hierbas en la primavera
- Enfermedades de plantas que hay que observar

Traiga muestras de insectos, enfermedades ó malas hierbas para que sean indentificado(a)s

Infórmese a cerca de *incentivos* cuando reserve su lugar al (805) 781-1117

Pest Control for Maintenance Gardeners

CE Hrs Requested	Time	Speaker/ Affiliation	Topic	% of Time related to Pest Management	% of Time related to Pesticides
.25 hr O	7:00 am - 7:15 am	N/A	Registration/Product display	100%	0%
.5 hr O	7:15 am - 7:45 am	Mary Bianchi, UC Cooperative Extension	Gopher, Mole, and Vole Control	100%	0%
.25 hr O	7:45 am - 8:00 am	Mary Bianchi, UC Cooperative Extension	Spring Weed Management and Control	100%	0%
.25 hr O	8:00 am - 8:15 am	Mary Bianchi, UC Cooperative Extension	Plant Diseases to Watch for in Spring	100%	0%
.25 hr O	8:15 am - 8:30 am	Mary Bianchi, UC Cooperative Extension	Identification of Pest Problems	100%	0%

Total Hours Requested- 1.5

Script for Maintenance Gardener IPM Spring Training – March 2010

Pest Control using IPM – correct identification, correct timing, non chemical controls first, and then as the last resort use least toxic control method when using pesticides

Vertebrate Pest Control Why worry?

Correctly identify the pest – 5 minutes with discussion

Gophers – horseshoe-shaped mounds of loose soil (UC IPM)

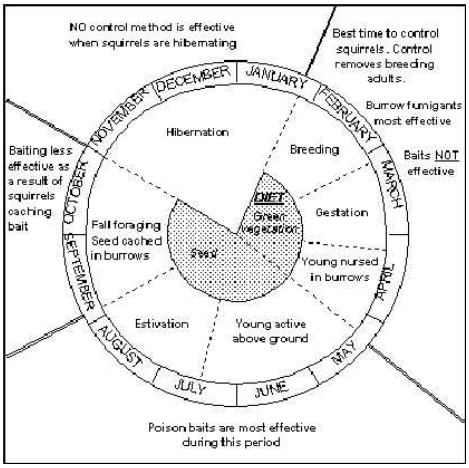
Moles – round mounds and shallow surface runways (UC IPM)

Voles – no mounds, short shallow burrows (UC IPM)

Ground squirrels – no mounds, open burrow (UC IPM)

Timing of controls

Gophers – year round
Moles – year round
Voles – year round
Ground squirrels – fumigation in late winter early spring, baits summer and early fall;
trapping when populations are low to moderate



Look for preventative or non-chemical control methods – 20 minutes

Exclusion – fencing may work for voles, baskets for gophers

Trapping

Gophers – safe and effective method

Set traps in main tunnels for Macabees and box traps

Set traps in sloping lateral tunnels for cinch traps

Demonstrate cinch traps and talk about:

Pros: less excavation
Humane kill
Easier to monitor

Cons: visible traps
Children and pets

Moles – best control method

Voles –

Mouse traps set at right angles to runs – don't handle carcasses without PPE

Ground squirrels – talk about the calendar

Methods to use in combination to reduce re-occurrence

Wrap-up and discussion

Weed Control –

Correctly identify the pest – North county weeds and South County weeds 5 minutes

The steps to do now for landscapes that may have gotten out of hand

1) Eliminate all the larger weeds by hoe, weedwacker or similar, or hand
   If it is too overwhelming, use well placed postemergence herbicides.
2) Follow up with 3 inches of bark mulch.
   Don't worry about the annual seedlings - the mulch should take care of them as long as it is >2" deep.
3) Where mulching is not possible, like a lawn, be sure to maintain good fertility to promote competition
   If the weeds are really going crazy in a lawn, a one-time application of liquid herbicide appropriate to the turf species and weed may be used.
   UC does not advocate the use of weed and feed type products.
4) For perennial weeds in a landscape bed, other actions need to be taken but they are more specific to each weed.

Methods to use in combination to reduce re-occurrence.

Introduce Landscape Identification Cards and spring disease section (10 minutes)

Notes from first Maintenance Gardener Trainings March 23-25, 2010

What worked

Holding trainings at 7am in locations close to jobs. Few people thought Saturday morning would be better or later in the morning better, but most felt time worked.
Concurrent Spanish language translation worked when had two translators paired one on one with Maintenance Gardeners . Didn't work when more than 3 participants per translator – ended up in side conversations from group. Worked better to have all materials already in Spanish (which we did by the third training). Although working from a script, dress rehearsal would help translators anticipate next topics.

Didn't do a dress rehearsal ahead of time, which would have been good. By third training had a slightly different set of materials from lessons learned from first two meetings. Didn't use any projected materials. Used handouts and pictures blown up to 8X11 materials, laminated. Pictures and graphs very successful. Ground squirrel calendar was most popular and a relatively inexpensive incentive.

Had a single main trainer who brought in peer trainers when appropriate, and stimulated participation and information exchange from the group. Had one peer trainer very familiar with labeled products and could provide information on materials that the Maintenance Gardeners use . The other peer trainer works in industry, and offered specific site situations.
Feedback – hit targeted needs. Complete shot in the dark but it worked!

Things to Keep
Very informal atmosphere with one main topic and introduce topic of the next training. In this training we covered Vertebrate pests, including gophers, voles, ground squirrels, moles. We had hoped to cover weeds and beginning of diseases but found it was too much for the 1.5 hour time. Focus on one main topic, and then either solicit information for next training or suggest next topic to determine interest.

Evaluation survey used was a post retrospective looking at participant confidence level pre and post training. One individual felt confidence level went down. Most appreciated training felt on target and would be useful.

Incentives – cinch trap demonstrated during program, hand lens and quick tip cards. One issue with quick tips regarding translation of gophers as tuzas vs topo. Spanish language folks helped with most appropriate term. Topo was what they recognized. What was more confusing for them was the term for moles vs gophers.

One and half hour was just about right time for sign in, one hour training and demonstration, and to sign up for hours. Four trainings would give them 6 hours. Laws and regulations need to be handled in a separate training.

Keep in mind that a dress rehearsal is also an opportunity for Master Gardener continuing education.

COURSE EVALUATION
March 16, 2010
Paso Robles Farm Supply

March 16, 2010
I gained useful information in this session

Yes _____ No _____ Not sure _____

I will incorporate this information into my operations in the next ____ 6 months ____ 12 months
____ 18 months ____ 24 months

I don't think I will be able to incorporate this information into my operations _____
Overall, I would rate this session (please circle):

Excellent Good Fair Needs Improvement

What would you like more information on?
_____

_____

Before the training, did you feel confident in rodent control? YES NO NOT SURE

Do you feel more confident now that you had the training? YES NO NOT SURE

What was the most helpful part of the session?_____
_____

What topics would you like more information on? _____
_____

_____

Other Comments/Suggestions:_____
_____
_____
_____
_____

Thanks for taking the time to complete this evaluation. Your feedback for these courses is very important!

Evaluación del Curso
Entrenamiento para Jardineros de Mantenimiento
Farm Supply de San Luis Obispo
Marzo 18, 2010

1. ¿Ganó usted información útil en este entrenamiento?
   SI NO NO ESTOY SEGURO

2. En general, yo califico esta sesión como (circule una de las opciones siguientes):
   EXCELENTE BUENA MAS O MENOS NECESITA MEJORAR

3. ¿Antes del entrenamiento de hoy, se sentía usted seguro de cómo controlar roedores? (En una escala de 1 a 5, 1 es el valor de no estar nada seguro y 5 el valor de estar muy seguro).

Nada Seguro				Muy Seguro
1	2	3	4	5

4. ¿Qué tan seguro se siente acerca del control de roedores, ahora que ya ha recibido el entrenamiento?

Nada Seguro				Muy Seguro
1	2	3	4	5

5. ¿Qué tan seguido le preguntan sus clientes acerca del control de plagas y enfermedades?
   Nunca Una vez al mes Una vez a la semana Todos los días Muchas veces al día

6. ¿Qué plagas le preguntan sus clientes con más frecuencia?
   Malezas (malas hierbas) Insectos Roedores Enfermedades de plantas

7. ¿Cuándo siente usted que podría poner en práctica la información que aprendió en este entrenamiento?
   6 meses 12 meses 18 meses 24 meses

8. ¿Qué temas podríamos agregar a este entrenamiento?
   _____
   _____
   _____
   _____

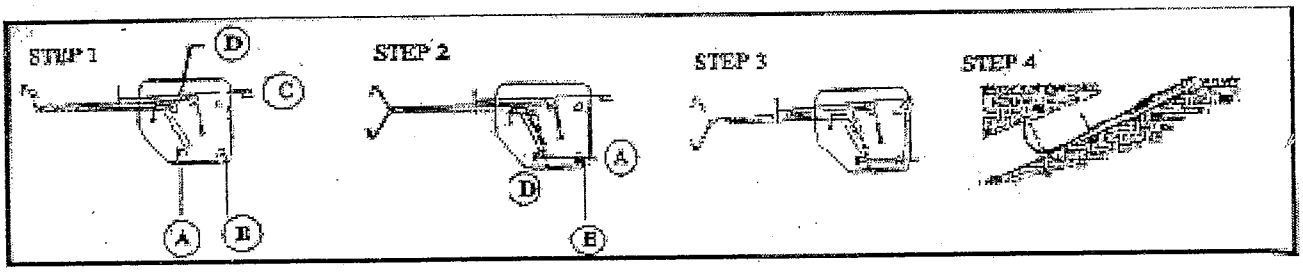
9. ¿Otros comentarios ó sugerencias:
   _____
   _____
   _____
   _____
   _____

WILDLIFE CONTROL SUPPLIES

P.O. Box 653
Simsbury, CT 06070
Ph: (860) 844-0101
http://www.wildlifecontrolsupplies.com/

Product Overview – Cinch Gopher Trap

A-Forward Set Wire B-Rear Set Wire C-Trigger Wire D-Active Jaw Wire



HOW TO SET A CINCH TRAP

Step 1: Hold the trap so the set wires A & B are hanging loose. Pull the trigger wire C back as show in the illustration, the trap is now ready to be set.

Step 2: Holding the trap firm with one hand, raise the active jaw wire D and lower it to the opposite side of the trap base. Position the forward set wire across the active jaw wire as shown.

Step 3: Position the rear set wire B across set wire A. Push the trigger wire C forward making sure the set wire B is positioned behind the tab as illustrated. When you push the trigger wire C make sure you are in the guide area on the rear of the trap base.

Step 4: The trap is now set and ready to be positioned into the gopher run.

Cinch Trap Placement: Dig away dirt on top of gopher's mound to expose hole. Insert the trap into the hole as shown in step 4 above, making sure that the jaws of the trap fit snug against the wall of the hole by twisting back and forth. Leave the hole open to encourage the gopher to investigate the change in the tunnel system. The gopher comes between the jaws and activates the trigger mechanism and the powerful steel spring closes the jaws shut around the gophers middle with instantaneous effectiveness. Remove the trap, release and dispose of the carcass. Check area for other activity and set as necessary.

WILDLIFE CONTROL SUPPLIES

P.O. Box 653
Simsbury, CT 06070
Ph: (860) 844-0101
http://www.wildlifecontrolsupplies.com/

Tunnel Information: Gophers are active throughout the year and fresh workings may be found in any month. A gopher will dig up to 7 or 8 tunnels, which may extend as much as 800 feet each. Most of the tunneling activity can be seen during the fall. Burrows vary from 2 to 3 inches in diameter. These are mostly parallel to the ground surface, usually at depths of from 6 to 12 inches, with secondary tunnels down 24 to 30 inches. New activity sometimes is not visible above ground, because the gopher is very capable of backfilling tunnels that are no longer needed. By fall, one gopher will have accumulated seven or eight storage rooms packed with tubers, and roots. Because of its subterranean nature and the sometimes-limited amount of surface sign, the damage caused by this animal often goes unnoticed.

Gopher Identification: Names for external fur-lined cheek pouches for carrying vegetative matter, also a burrowing animal with soft and glossy body hair, inconspicuous ears with large upper and lower incisors they vary by species in size from 6" to 13". Excavated crescent shaped mounds produced while tunneling for succulent portions of plants. They are active year round, are solitary and defensive. They can control territory up to 2000 square feet.

Reproduction & Life Cycle: On an average, the female will have 1 or 2 broods per year, with 5 to 6 young, but more often, larger broods if survival conditions are good and local gopher population is down. On pasturelands and on uncultivated and non-irrigated areas there is evidently a limited breeding season, some time after the beginning of the spring rains, when green forage becomes available in quantity. On such areas there is probably a single, annual brood. In irrigated regions, especially in alfalfa fields where green forage is always available, breeding occurs throughout the year. In such places, a female may bear up to 4 litters per year, and have as many as 13 young.

Eating Habits: The gopher is an underground dweller, only occasionally coming above ground at night to feed or migrate. It has external cheek pouches in which food is carried. Gophers cut roots of trees, vines and gnaw the bark of trees, at times complete encircling them so that they die. The gopher cuts the roots of plants beneath the surface, and then pulls the rest of the plant into the burrow. They can consume and destroy large amounts of vegetation.

University of California
Agriculture and Natural Resources

Making a Difference for California

WEED CONTROL IN LAWNS FOR MAINTENANCE GARDENERS

2 HOURS OF CONTINUING EDUCATION CREDIT AVAILABLE

DATES AND LOCATIONS

Tuesday ***June 22nd***, 2010- 7-9:00 A.M.
Paso Robles- Centennial Park
600 Nickerson Drive

Wednesday ***June 23rd***, 2010- 7-9:00 A.M.
San Luis Obispo- UC Master Gardener Demo. Garden
Next to- 2156 Sierra Way

Thursday ***June 24th***, 2010- 7-9:00 A.M.
Grover Beach- Ramona Garden Park
993 Ramona

TOPICS

- ***Managing Weeds in Lawns***
- ***Irrigation Practices that Reduce Weeds***

Bring in insect, disease, or weed samples to have identified!

Find out about *incentives* when you RSVP (805) 781-1117

University of California
Agriculture and Natural Resources

Making a Difference for California

CONTROL DE PLAGAS Y ENFERMEDADES PARA JARDINEROS DE MANTENIMIENTO

2 HORAS DE CREDITO DE EDUCACION CONTINUA

Fechas y Lugares

Martes ***Junio 22nd***, 2010- 7-9:00 A.M.
Paso Robles- Centennial Park
600 Nickerson Drive

Miércoles ***Junio 23rd***, 2010- 7-9:00 A.M.
San Luis Obispo- Jardin de Demonstración
2156 Sierra Way

Jueves ***Junio 24th***, 2010- 7-9:00 A.M.
Grover Beach- Parque del Jardin Ramona
993 Ramona

Topicos

- ***Manejo de Malas Hierbas (Malezas) Dentro de Céspedes***
- ***Practicas de Riego que Reducen las Malas Hierbas***

Traiga muestras de insectos, enfermedades ó malas hierbas para que sean indentificado(a)s

Infórmese a cerca de *incentivos* cuando reserve su lugar al (805) 781-1117

Weed Control In Lawns for Maintenance Gardeners

CE Hrs Requested	Time	Speaker/ Affiliation	Topic	% of Time related to Pest Management	% of Time related to Pesticides
.25 hr O	7:00 am - 7:15 am	N/A	Registration/Product display	100%	0%
.75 hr O	7:15 am - 8:00 am	Cheryl Wilen UC Statewide IPM Program	Weed ID, Weed Life Cycles, Monitoring and Control	100%	0%
.50 hr O	8:00 am - 8:30 am	Farm Supply Company Rep.	Appropriate Irrigation for Turf to Reduce Pesticide Runoff and Weed Growth	100%	0%
.25 hr O	8:30 am - 8:45 am	Cheryl Wilen UC statewide IPM Program	Discussion on Lawn Removal, Pest Resistant Alternatives, Issues with Weed and Feed Products	100%	0%
.25 hr O	8:45am - 9:00am	Mary Bianchi, UC Cooperative Extension	Survey, Pest Concerns for Future Workshops	100%	0%

Total Hours Requested- 2.0

Course Evaluation
Maintenance Gardener Training
Ramona Garden Park, Grover Beach
June 24, 2010

1. Did you gain useful information in this training?
   YES NO NOT SURE

2. Overall, I rate this session (please circle)
   EXCELLENT GOOD FAIR NEEDS IMPROVEMENT

3. Before the training today, did you feel confident in controlling weeds in lawns?

   NOT CONFIDENT VERY CONFIDENT
   1 2 3 4 5

4. How confident do you feel about controlling weeds in lawns now that you had the training?

   NOT CONFIDENT VERY CONFIDENT
   1 2 3 4 5

5. How confident do you feel about using irrigation to control weeds in lawns?

   NOT CONFIDENT VERY CONFIDENT
   1 2 3 4 5

6. How often do customers ask questions about weed control options?

   Never Once a month Once a week Daily Multiple times per day

7. What pests are customers currently asking about?

   Weeds Insects Vertebrates Plant Diseases

8. When do you feel you could implement information from this training?

   6 months 12 months 18 months 24 months

9. What topics could we add to this training?
   _____
   _____
   _____
   _____

10. Other comments/suggestions?
    _____
    _____
    _____
    _____

Thank you!

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Evaluación del Curso
Entrenamiento para Jardineros de Mantenimiento
Centennial Park
Junio 22, 2010

1. ¿Ganó usted información útil en este entrenamiento?
   SI NO NO ESTOY SEGURO

2. En general, yo califico esta sesión como (circule una de las opciones siguientes):
   EXCELENTE BUENA MAS O MENOS NECESITA MEJORAR

3. ¿Antes del entrenamiento de hoy, se sentía usted seguro de cómo controlar malezas en pastos de jardines?
   NADA SEGURO MUY SEGURO
   1 2 3 4 5

4. ¿Qué tan seguro se siente acerca del control de malezas en pastos de jardines, ahora que ya ha recibido el entrenamiento?
   NADA SEGURO MUY SEGURO
   1 2 3 4 5

5. Que tan seguro se siente usted acerca de usar el riego como método de control de malezas en pastos de jardines?

   NADA SEGURO MUY SEGURO
   1 2 3 4 5

6. ¿Qué tan seguido le preguntan sus clientes acerca de control de malezas?
   Nunca Una vez al mes Una vez a la semana Todos los días Muchas veces al día

7. De cuáles plagas le preguntan sus clientes con más frecuencia?
   Malezas (malas hierbas) Insectos Roedores Enfermedades de plantas

8. ¿Cuándo siente usted que podría poner en práctica la información que aprendió en este entrenamiento?
   6 meses 12 meses 18 meses 24 meses

9. ¿Qué temas podríamos agregar a este entrenamiento?
   _____
   _____
   _____
   _____

10. ¿Otros comentarios ó sugerencias:

    _____
    _____
    _____
    _____

Muchas Gracias!

c:\users\mbianchi\documents\y2012\activities\maintenance gardeners final report\appendix a attachements\surveys\survey june 2010 spanish.doc

Common Weeds in Lawns- San Luis Obispo

http://www.ipm.ucdavis.edu/TOOLS/TURF/PESTS/weedkey.html

CRABGRASS

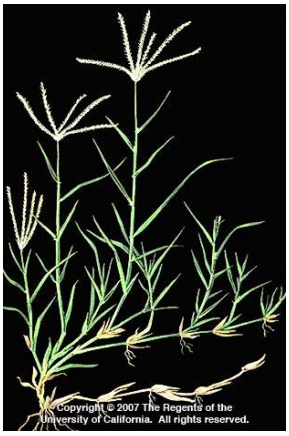
Spring/Summer annual weed
Control by reducing irrigation, check for leaks, over-seeding. Pre-emergence herbicide application in Feb. Note seed heads (right) come out from different places. Compare to Bermuda grass below.

OXALIS, WOODSORREL

Found year-round-sometimes has purple leaves. Often confused with clover but has heart-shaped leaflets and five-petals on yellow flowers. Seeds expelled from pods (right) and stick to mowers.
Clean mowers with air or water. Post-emergence herbicides but make sure they are safe on the turf species.

BERMUDAGRASS

Perennial. Grows in warm weather. Spreads by seeds, stolons, rhizomes. Can use non-selective herbicide or mechanical means to renovate. Some postemergence herbicides depending on turf species.
Note seed head (left) meets at one point.



KIKUYUGRASS

Perennial. Grows in warm weather. Spreads by seeds, stolons, rhizomes. Can use non-selective herbicide or mechanical means to renovate. Some postemergence herbicides depending on turf species. Flowers look link white fungus on cool, humid days.

DANDELION

Perennial. Grows best in moist areas in full sun but can survive some shade and dry conditions once established. Grows year round in California except in the coldest areas. Can resprout from its deep tap root. Remove by digging, post emergence spot sprays, or pre-emergence herbicides.

BUR CLOVER (LEFT), BLACK MEDIC (RIGHT)
Annual species. Burs on bur clover can be spiny or smooth.
Black medic is similar looking but does not have burs.
Control by hand pulling, increasing N and reducing P, herbicides depending on turf species.

YELLOW NUTSEDGE
Perennial that sprouts from tubers in spring and dies back in late fall. Flowers are green-yellow. Produces numerous tubers. Often introduced in contaminated topsoil or fill. Hand pull frequently, dig up small sections at least 10" deep, modify irrigation and drainage, post-emergence herbicides applied before 5 leaf stage.

PURPLE NUTSEDGE
Perennial that sprouts from tubers in spring and dies back in late fall. Generally found in warmer locations. Produces numerous tubers. Tubers often found in chains (right). Flowers are reddish brown. Often introduced in contaminated topsoil or fill. Hand pull frequently, dig up small sections at least 10" deep, modify irrigation and drainage, post-emergence herbicides applied before 5 leaf stage.

ANNUAL BLUEGRASS
Cool weather annual. Shallow roots, tuft-like growth. Spreads by seeds which are produced very quickly. Grows best in moist areas. Hand pull, modify irrigation. Premergence herbicides must be applied by early September. Difficult to control with postemergence herbicides.

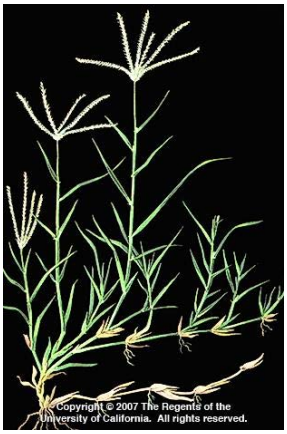
Malas Hierbas en Pastos de Jardines

http://www.ipm.ucdavis.edu/TOOLS/TURF/PESTS/weedkey.html

ZACATE MANO DE CANGREJO
Durante la primavera y el verano esta maleza se puede controlar reduciendo riegos, asegurándose que no tenga tuberias rotas o escape de agua, resembrando. Herbicidas de pre-emergencia se deben aplicar en febrero. Note que cabezas de semillas (derecha) vienen de diferentes lugares. Compárela con Zacate de Bermuda abajo.

ACEDERILLA Se encuentra en todo el año. Algunas veces tiene hojas púrpuras. Con frecuencia se le confunde con el trébol pero tiene hojas de forma de corazón y cinco pétalos en flores amarillas. Las semillas son expulsadas de las vainas (vea derecha) y se pegan a la cortadora de pasto. Limpie su cortadora de pasto con aire ó agua. Herbicidas de post-emergencia pueden usarse pero asegúrese que no van a causar daño a los pastos.

PASTO BERMUDA Perenne. Crece in clima cálido. Crece mejor bajo el sol y a altas temperaturas. Se duerme y vuelve café en el invierno. Es eficiente en el uso de agua. Puede dañarse severamente con el tráfico durante el invierno, dándole oportunidad a las malezas a invadir. Se propaga por semilla, estolones, rizomas. Puede usar herbicidas no-selectivos o maneras mecánicas para quitarlo. Algunos herbicidas de post-emergencia, dependiendo de las especies de gramíneas que se tengan, pueden usarse. Note la cabeza de la semilla (izquierda) se junta en un punto.



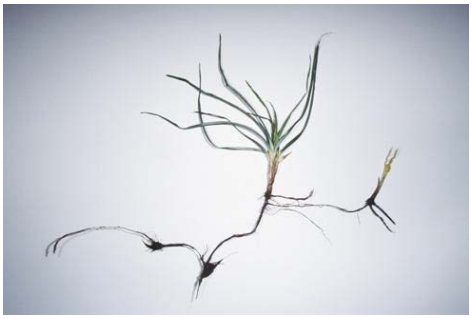
PASTO KIKUYO
Perenne. Crece en clima cálido. Se propaga por semillas, estolones, rizomas. Puede usar herbicidas no-selectivos ó métodos mecánicos para renovarse. Algunos pesticidas de post-emergencia pueden usarse dependiendo de las especies de césped que tenga. Las flores parecen enlaces blancos de hongos en días frescos y húmedos. Es sensible a bajas temperaturas pero se recupera rápidamente de uso moderado ó daño severo.

DIENTE DE LEÓN (AMARGÓN)
Perenne. Crece mejor en áreas húmedas bajo sol pero puede sobrevivir algunas sombras y condiciones secas una vez que se haya establecido. En California crece todo el año excepto en las áreas más frías. Puede retoñar de sus profunda raíz pivotante. Puede eliminarla escarbándola, usando herbicidas de post-emergecia, ó pre-emergencia.

TRÉBOL FRESA (IZQUIERDA), ALFALFA NEGRA (DERECHA)
Especie anual. Los frutos de trébol fresa pueden ser espinosos ó lisos. Alfalfa negra puede ser similar pero no tiene fresas. El mejor control es arrancarlas a mano, incrementando nitrógeno y reduciendo fósforo. Se pueden usar herbicidas dependiendo de las especies de césped que se tengan.

COQUILLO AMARILLO
Perenne. En la primavera se propaga de tubérculos y muere al final del otoño. Las flores son verde-amarillas. Produce numerosos tubérculos. Con frecuencia introducido en suelo contaminado. Se controla arrancándolo a mano frecuentemente, escarbando secciones pequeñas de por los menos 10 pulgadas de profundidad, modificando irrigación y drenaje. Herbicidas de post-emergencia deben ser aplicados antes de que aparezca la hoja 5.

COQUILLO PÚRPURA
Perenne. Se propaga de tubérculos en la primavera y muere a finales del otoño. Generalmente se encuentra en lugares cálidos. Produce numerosos tubérculos usualmente en cadenas. Las flores son café-rojizas. Con frecuencia se introducen en suelo contaminado. Jalarlas a mano con frecuencia, escarbarlas en secciones pequeñas de por lo menos 10" de profundidad, modificar riego y drenaje, herbicidas de post-emergencia pueden ser aplicados antes de la fase donde aparece la quinta hoja.



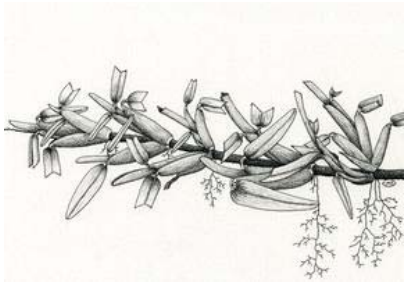
PASTO AZUL ANUAL
Maleza de clima templado. Raíces superficiales que crecen como un penacho. Se reproducen por semillas las cuáles son producidas muy rápidamente. Crece mejor en áreas húmedas. Arránquelas a mano, modifique el riego. Herbicidas de pre-emergencia pueden ser aplicados a principios de septiembre. Difícil de controlar con herbicidas de post-emergencia.

Common Turfgrass Species

http://ipm.ucdavis.edu/TOOLS/TURF/TURFSPECIES/index.html

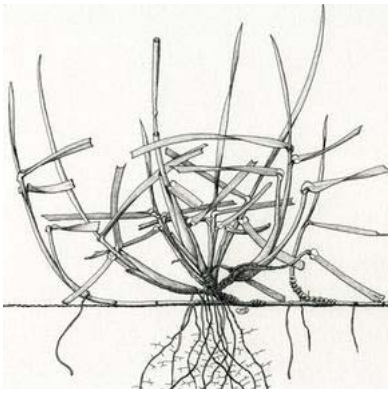
ST. AUGUSTINEGRASS

Warm-season turfgrass. Prefers full sun, but has a high tolerance for shade. Grows quickly during the summer months, but slows down during the spring and fall and enters a dormancy period in the late autumn Not wear tolerant, it is used for lawns and general purpose turf.
Broad blades, medium-green. Leaves and stems are hairless. The stolon and leaves have a flat appearances. Prostrate, creeping growth habit. Spreads by stolons.



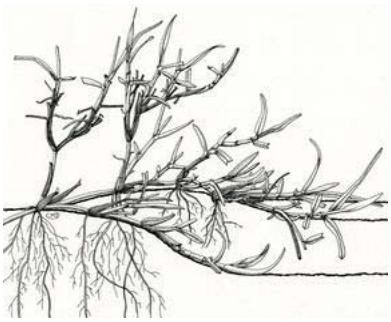
TALL FESCUE

Cool-season grass, well adapted to sunny or partially shady areas. Stays green during cool weather. . New varieties that are finer in texture and shorter in stature are known as turf-type tall fescues and dwarf turf-type tall fescues. The most common lawn grass in California.
Coarse-textured medium to dark-green grass. Has a bunch-type growth habit rather than a creeping-type, open areas may develop and need to be reseeded.



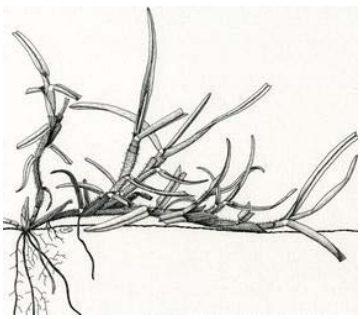
BERMUDAGRASS

Warm-season grass. It does best in full sun and high temperatures. Goes dormant and turns brown in winter. Very water-efficient. Can be severely damaged from traffic during the winter months when they are not growing, giving weeds a chance to invade. Medium to coarse-textured gray-green grass. Hybrids are more fine-textured and vary in color from deep blue-green to dark green. Spreads by rhizomes and stolons.



BERMUDAGRASS

Warm-season grass that spreads quickly and thrives in areas with moderate temperatures. Extremely vigorous growth habit. Susceptible to cold but is able to recover quickly from moderate wear or severe injury. Although once considered to be primarily a weed, kikuyugrass is now sometimes managed as a turf species. Coarse-textured, light green grass, sometimes mistaken for St. Augustinegrass. Spreads by seeds, rhizomes, and stolons.

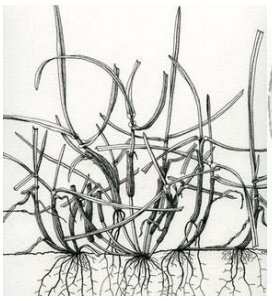


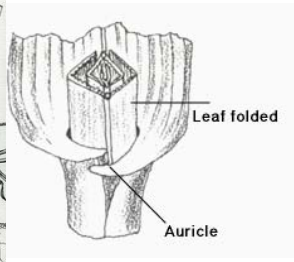
ESPECIES DE CÉSPED MÁS COMUNES

http://ipm.ucdavis.edu/TOOLS/TURF/TURFSPECIES/index.html

RAIGRÁS PERENNE

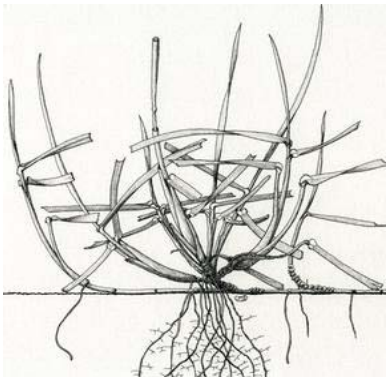
Hierba de temporada fresca, bien adaptada a las regiones costeras. Prefiere sol pleno pero tolera sombra parcial. Puede tolerar mucho tráfico. Su rápida aparición, ayuda a suprimir las malezas. De textura fina, con la hoja doblada en la yema. La parte posterior de la hoja es brillosa, y las puntas de las hojas son cónicas. El collar tiene generalmente crecimientos (aurículas) que cierran el tallo. No produce rizomas o estolones. Tiene un hábito de crecimiento de tipo pajonal.





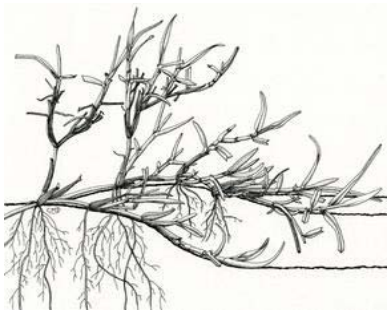
FESTUCA ALTA

Pasto de estación fresca, bien adaptado a áreas bajo sol ó parcialmente bajo sombra. Se mantiene verde durante clima templado. Se han introducido nuevas variedades de festuca que son más finas en textura como lo es el césped festuca tipo alto y más cortas en estatura como lo es el césped festuca tipo enano. Es el tipo de pasto más utilizado como césped California. Es de textura gruesa con un tono de medio verde oscuro. Es de tipo amontonada en lugar de tipo rastrera. Puede ser necesario que se resiembre ya que pueden encontrarse algunas áreas abiertas. Se de pocas necesidades de mantenimiento, elevada resistencia al pisoteo, tolera sequías y gran capacidad de adaptación a condiciones adversas. Se reproduce vegetativamente por ahijamiento. Altura de corte entre 4 y 6 cm.



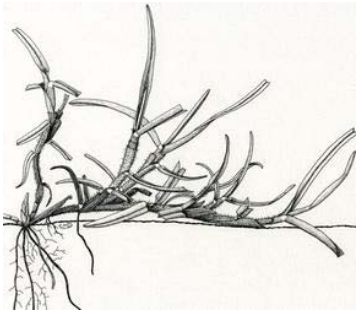
PASTO BERMUDA

Perenne, de estación cálida. De crecimiento rastrero muy vigoroso, textura media a fina y alta resistencia al pisoteo y sequías. Crece mejor bajo sol completo y altas temperaturas. Se vuelve inactivo y de color café en el invierno. Alta resistencia a la sequía. Puede dañarse fácilmente con el tráfico durante los meses de invierno cuando no está creciendo, dándole oportunidad a las malezas a invadir. Es de textura media a gruesa con un tono entre gris a verde. Híbridos son de textura mas fina y varían en color de verde-azul intenso a verde oscuro. Se extiende a través de rizomas y estolones. Altura de corte entre 2 y 5 cm.



PASTO KIKUYO

Pasto de estación calida que se esparce rápidamente y prospera en áreas te temperatura moderada. Susceptible al frío, de crecimiento muy agresivo que le permite dominar los demás tipos de pasto que se siembran con él. Provee un pasto muy agradable por el color de sus hojas y su textura. Soporta el tránsito intenso, pero no tolera sombras. Se recupera rápido de daño por uso moderado ó de daño severo. Antes era considerado como una maleza. Ahora se le usa algunas veces como un tipo de césped. Algunas veces se confunde con el pasto San Agustín. Se extiende por semilla, rizomas y estolones. La altura de corte ideal es entre 3 y 4 cm.



UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

SAMPLE RECEIVED
(Attach to sample)

Date Received: _____ Received by: _____

Referred to: Mary Bianchi: 805-781-5949 or mlbianchi@ucdavis.edu

Name: _____

Address: _____ **City:** _____ **Zip Code:** _____

Preferred contact: Phone _____ **E-mail** _____

Name of Plant, if known_____

What you would like to know about this sample:_____

_____

_____

_____

_____

Take samples to UC Cooperative Extension at 350 Main Street in Templeton, 2156 Sierra Way in San Luis Obispo or 810 West Branch in Arroyo Grande

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

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UNIVERSIDAD DE CALIFORNIA EXTENSION COOPERATIVA

Muestra recibida
(Adjuntara la muestra)

Fecha de recepción: _____ Recibida por: _____

Hágale saber a Mary Bianchi: 805-781-5949 o mlbianchi@ucdavis.edu

Nombre: _____

Dirección: _____ **Ciudad:** _____ **Código postal:** _____

Contacto preferido: Teléfono _____ **E-mail** _____

Nombre de la planta si se conoce_____

Que te gustaría saber acerca de esta muestra:_____

_____

_____

_____

_____

Lleve las muestras a UC Cooperative Extension: 350 Main Street en Templeton, 2156 Sierra Way en San Luis Obispo, o 810 West Branch en Arroyo Grande

UNIVERSIDAD DE CALIFORNIA EXTENSION COOPERATIVA

Muestra recibida
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Hágale saber a Mary Bianchi: 805-781-5949 o mlbianchi@ucdavis.edu

Nombre: _____

Dirección: _____ **Ciudad:** _____ **Código postal:** _____ ___

Contacto preferido: Teléfono _____ **E-mail** _____

Nombre de la planta si se conoce_____

Que te gustaría saber acerca de esta muestra:_____

_____

_____

_____

_____

Lleve las muestras a UC Cooperative Extension: 350 Main Street en Templeton, 2156 Sierra Way en San Luis Obispo, o 810 West Branch en Arroyo Grande

University of California
Agriculture and Natural Resources

Making a Difference for California

INSECT AND DISEASE CONTROL IN LANDSCAPES FOR MAINTENANCE GARDENERS

2 HOURS OF CONTINUING EDUCATION CREDIT AVAILABLE

DATES AND LOCATIONS

Tuesday ***September 14th***, 2010- 7-9:00 Morning
Paso Robles- Farm Supply Company
1108 Paso Robles St., PR

Wednesday ***September 15th***, 2010- 2-4:00 ***Afternoon***
San Luis Obispo- Farm Supply Company
224 Tank Farm Rd., SLO

Thursday ***September 16th***, 2010- 7-9:00 Morning
Arroyo Grande- Farm Supply Company
1079 El Camino Real, AG

TOPICS

- ***Prevention and management of insect pests and diseases in the landscape.***

Bring in insect, disease, or weed samples to have identified!

Find out about *incentives* when you RSVP (805) 781-1117

University of California
Agriculture and Natural Resources

Making a Difference for California

CONTROL DE INSECTOS Y ENFERMEDADES PARA JARDINEROS DE MANTENIMIENTO

2 HORAS DE CREDITO DE EDUCACION CONTINUA

Fechas y Lugares

Martes ***Septiembre 14***, 2010- 7-9:00 de la mañana
Paso Robles- Farm Supply Company
1108 Paso Robles St., PR

Miércoles ***Septiembre 15***, 2010- 2-4:00 de ***la tarde***
San Luis Obispo- Farm Supply Company
224 Tank Farm Rd., SLO

Jueves ***Septiembre 16***, 2010- 7-9:00 de la mañana
Arroyo Grande- Farm Supply Company
1079 El Camino Real, AG

Topicos

- ***Prevención y control de plagas y enfermedades que occurren en los jardines.***

Traiga muestras de insectos, enfermedades ó malas hierbas para que sean indentificado(a)s

Infórmese a cerca de *incentivos* cuando reserve su lugar al (805) 781-1117

Pest Control for Maintenance Gardeners - Insects and Diseases

CE Hrs Requested	Time	Speaker/ Affiliation	Topic	% of Time related to Pest Management	% of Time related to Pesticides
.25 hr O	7:00 am - 7:15 am	N/A	Registration/Product display	100%	0%
.25 hr O	7:15 am - 7:30 am	Mary Bianchi, UC Cooperative Extension	Pest Problem vs. Abiotic Disorder Identification Methods and Monitoring	100%	0%
.5 hr O	7:30 am - 8:00 am	Mary Bianchi, UC Cooperative Extension	Common Insect Pests of the Landscape and Management	100%	0%
.5 hr O	8:00 am - 8:30 am	Mary Bianchi, UC Cooperative Extension	Common Plant Diseases of the Landscape and Management	100%	0%
.5 hr O	8:30 am - 9:00 am	Mary Bianchi, UC Cooperative Extension	Surveys, Questions and Pest Concerns for Future Workshops	100%	0%

Total Hours Requested- 2.0

Script for Fall Maintenance Gardener Training – September 2010

Resources to point out to attendees
- Lawn and Residential Pest Control Handbook – ANR Publication 3510
- Landscape ID Cards – ANR Publication 3513; given as incentive
- Hand lens – given as incentive – and demonstrate how to use a hand lens

Diagnosing Plant Problems
- Problems caused by living versus non-living factors – biotic vs abiotic
- Abiotic example we used – redwood trees in north county areas (inland valleys)
  - Asked how many had redwood trees in landscapes?
  - How many had problems, what did they see, how did they manage?
    - Mild climate with high humidity
    - Winter average temperatures 38 F, summer 57-80 F range
    - 25-100" rainfall in winter, heavy summer fog
    - Adapted to deep well-drained neutral soils – not tolerant of high MG or Na
    - At 4 to 8 years old begin to show stress
    - Manage with deep monthly irrigation to push salts and a deep mulch layer
    - Participant recommended not limbing up so that litter from tree accumulated.

- Curling leaves - very obvious in landscape can be biotic or abiotic
  - Glyphosate injury from overspray – plate 42
    - Showed handout with symptoms
    - How to avoid –
      - Shielded spray
      - Hand hoe around sensitive plants
    - Mulch etc
  - Thrips – had fresh samples of myoporum thrips; showed landscape card plate8
    - Tiny, shaped like a cigar
    - Asymmetric mouth parts, puncture cells and suck up contents
    - Myoporum thrips vs most other thrips
    - Hard to control with chemicals – tolerate or new plants
  - Aphids - had samples of plum leaf curl and aphids on milkweed – plate 9
    - Showed peach leaf curls – open up curls with hand lens
    - Differentiate from Peach Leaf Curl by timing and what's inside the rolled leaves
    - Piercing sucking mouthparts
    - Populations can explode because of asexual reproduction in summer – up to 12 new aphids/day
    - Biological controls – we used a digital microscope to show syrphid fly larvae in rolls of peach leaves and parasitized aphids; used quick tip card on beneficial and landscape id cards plates 1-3
  - Ants – role in tending aphids (this was a revelation to several of the participants)

What is honeydew – pointed out great graphics in Publication 3510

Trim and skirt up trees – single point of entry
Exclude ants with sticky material like Tanglefoot in band around trunk – protect the bark with duct tape, fabric tree wrap (nobody knows where to find this) or flagging tape. Check every 1 or 2 weeks and stir with stick to re-surface
Ant stakes with bait. Baits are slow acting on purpose – want to have the toxicant taken to the nest.

Other insects – Giant whitefly plate 18, psyllids (Eugenia) plate 13, scales plates 15 and 16, borers plates 21 to 23. Gave out English and Spanish quick tip cards where available. Brought fresh samples where available

Sanitation – you can move these insects! Clean equipment is part of every job.
What about moving diseases with pruning equipment?
Some lack of clarity on the question, but if you are pruning healthy plants there is probably no need to worry about disinfecting pruning equipment. If you are pruning sick or diseased plants there is only direct evidence of transfer with a few diseases. Sanitation may be a good practice when pruning diseased plants. Keep pruning equipment in good condition, sharpened, and remember to protect the equipment after using chemicals to sanitize.

Gave out sharpener for bypass pruners and a small can of WD40 as incentive.

Diseases – tried to cover powdery mildew, rust, and peach leaf curl but only had time for a very brief discussion at all three sessions.

Course Evaluation
Maintenance Gardener Training
Arroyo Grande Farm Supply Location
September 16, 2010

1) Did you gain useful information in this training?

YES NO NOT SURE

2) Overall, I would rate this session (please circle)

EXCELLENT GOOD FAIR NEEDS IMPROVEMENT

3) Before the training today, did you feel confident in diagnosing plant problems?
On a scale of 1-5, 1 being not at all confident, 5 being very confident?

Not Confident				Very Confident
1	2	3	4	5

4) How confident do you feel about diagnosing plant problems, now that you had the training?
On a scale of 1-5, 1 being not at all confident, 5 being very confident?

Not confident				Very Confident
1	2	3	4	5

5) How often do customers ask questions about pest control options?
Never
Once a month
Once a week
Every day
Multiple times a day

6) What pests do customers ask about most often? (Circle all that apply)
Weeds
Insects
Vertebrates
Plant Diseases

7) When do you feel you could implement information from this training?
_____6 months _____12 months
_____18 months _____24 months

8) What topics could we add to this training?

_____

_____

_____

_____

_____

9) Other comments/ suggestions:

_____

_____

_____

_____

_____

_____

Evaluación del Curso
Farm Supply de Arroyo Grande
Septiembre 16, 2010

1. ¿Ganó usted información útil en este entrenamiento?
   SI NO NO ESTOY SEGURO

2. En general, yo califico esta sesión como (circule una de las opciones siguientes):
   EXCELENTE BUENA MAS O MENOS NECESITA MEJORAR

3. ¿Antes del entrenamiento de hoy, se sentía usted seguro diagnosticando problemas de plantas?
   (En una escala de 1 a 5, 1 es el valor de no estar nada seguro y 5 el valor de estar muy seguro).

Nada Seguro				Muy Seguro
1	2	3	4	5

4. ¿Despues del entrenamiento, qué tan seguro se sient dianosticando problemas de plantas?

Nada Seguro				Muy Seguro
1	2	3	4	5

5. ¿Qué tan seguido le preguntan sus clientes acerca de control de problemas de plantas?
   Malezas (malas hierbas) Insectos Roedores Enfermedades de plantas

6. ¿Cuándo siente usted que podría poner en práctica la información que aprendió en este entrenamiento?
   6 meses 12 meses 18 meses 24 meses

7. ¿Qué temas podríamos agregar a este entrenamiento?
   _____
   _____
   _____
   _____

8. ¿Otros comentarios ó sugerencias:
   _____
   _____
   _____
   _____
   _____

Appendix B. Summary of course evaluation responses from Retail and Maintenance Gardener Trainings in San Luis Obispo County in 2010.

Course Date	Course Timing	Location			Responses to questions regarding information gained and course quality (% of responses)						Responses regarding time in months needed to incorporate information gained (% of responses)				
			Number of participants	Number of Responses to Evaluation	Gained useful information	Excellent	Good	Fair	Needs Improvement	No Response	6	12	18	24	NR*
Retail Training															
January 12, 13, 14	Winter	Paso Robles, San Luis Obispo, Arroyo Grande	21	15	100	0	100	0	0	0	NA				
Maintenance Gardener Workshops															
March 16	Spring	Paso Robles	15	14	100	71	29	0	0	0	86	7	0	7	0
March 17	Spring	San Luis Obispo	10	10	100	60	30	10	0	0	100	0	0	0	0
March 18	Spring	Arroyo Grande	12	12	100	58	33	0	0	8	66[a]	0	0	0	25
June 22	Summer	Paso Robles	7	6	100	50	50	0	0	0	66	17	17	0	0
June 23	Summer	San Luis Obispo	14	11	100	73	18	9	0	0	73	9	0	0	18
June 24	Summer	Arroyo Grande	18	18	100	77	17	0	0	6	50	50	0	0	0
September 14	Fall	Paso Robles	10	9	100	89	11	0	0	0	100	0	0	0	0
September 15	Fall	San Luis Obispo	16	16	100	88	12	0	0	0	88	12	0	0	0
September 16	Fall	Arroyo Grande	13	13	100	77	23	0	0	0	85	15	0	0	0

[a] One respondent answered "anytime – bad question?"

Appendix C-1. Change in confidence levels as a result of participating in Retail Trainings in San Luis Obispo County in 2010.

Course Date	Course Timing	Location			Confidence level in making pest control decisions as a result of participating Before Training (number of responses)				
					Confidence level pre-workshop	Confidence level post-workshop		No response	# of respondents who indicated no change in confidence level as a result of participation
January 12, 13, 14	Winter	Paso Robles, San Luis Obispo, Arroyo Grande,	21	15	4.1[a]	4.5		0	5

[a] Average of responses to rating of level of confidence on 1 to 5 scale (1 = not very confident to 5=very confident)

Appendix C-2. Change in confidence levels as a result of participating in Maintenance Gardener Trainings in San Luis Obispo County in 2010.

Course Date	Course Timing	Location			Confidence level in making pest control decisions as a result of participating Before Training (number of responses)				Confidence level in making pest control decisions as a result of participating After Training (number of responses)			
			Number of participants	Number of Responses to Evaluation	Confident	Not confident	Not sure	No response	Confident	Not confident	Not sure	No response
March 16	Spring	Paso Robles	15	14	5	7	2	0	14	0	0	0
					Confidence level pre-workshop	Confidence level post-workshop		No response	# of respondents who indicated no change in confidence level as a result of participation			
March 17	Spring	San Luis Obispo	10	10	3.6[a]	4.4			4			
March 18	Spring	Arroyo Grande	12	12	3.8	4.9			2			
June 22	Summer	Paso Robles	7	6	3.8	4.3		1	2			
June 23	Summer	San Luis Obispo	14	11	3.2	4.3			4			
June 24	Summer	Arroyo Grande	18	18	3.3	4.5		1	2			
September 14	Fall	Paso Robles	10	9	2.4	3.9			1			
September 15	Fall	San Luis Obispo	16	16	3.1	3.9			2			
September 16	Fall	Arroyo Grande	13	13	3.1	4.0		1	4			

[a] Average of responses to rating of level of confidence on 1 to 5 scale (1 = not very confident to 5=very confident)

How often do customers ask questions about pest control options?	What pests do customer ask most about?	Does your store carry adequate products for alt. pest control?	Which category is you store least limited in alt. pest control products?	After the training are you more confident?	When will you implement information?	Who makes product choices for your store?	What topics could we add to this training?	Additional info that would be helpful to teach the public or landscapers?	Education level	How long in the nursery business?	Comments
multiple times per day.	All	Yes	Weeds	Yes	immediately	Dept Manager		Product Samples	Bachelors	6-10 years	Thank you ladies, this was informative.
multiple times per day.	Plant Diseases, mites, wh	Yes	Plant Diseases	Yes	Need more information	Dept Manager	Safety- First Aid when chemicals spill.	Prep. It was great.	Trade School	1-5 years	
multiple times per day.	Plant Diseases	Yes	Vertebrates	Yes	Tomorrow	I do	More chemical knowledge on individual products.	Probiotic earth/soil care.	Some college	30 years	
Varies at times of the year	Insects, plt diseases	No	Vertebrates	Yes	today	I do		Continued public outreach and education.	Bachelors	>11 years	I have limited space, but do send customers to get the product when
2-3 times /week	all- ants, rolly pollies, aphi	plenty of mulch, but other than that, not educated enough to say.	Fairly limited in all.	Yes	This month, but need more information	Corporate Office			Some college	<1 year	
Every day	insects, powdery mildew,	Yes	Insects	Yes	Tomorrow	Dept Manager/ Corporate			Bachelors	1-5 years	
Every day	Vertebrates- gophers	Yes	Weeds	Yes	Tomorrow	I do, Store Manager	How to work with vendors to express our concerns.	Cleaning tools to help prevent spread of disease.	Bachelors	1-5 years	
Every day	Weeds, insects, Vertebrat	Yes	Plant Diseases	Yes	Tomorrow	I do, Dept manager, Store mngr, Corporate office	Mole and gopher control		Bachelors	>11 years	
Every day	Insects- aphids and ants	Yes	Vertebrates	Yes	Tomorrow	I do, Dept Store Manager			Trade School	1-5 years	
multiple times per day.	Insects, vertebrates	Yes	Vertebrates	Yes	Tomorrow	I do	How to talk to customers, what questions to ask, steering them to alternatives.	Cleaning tools properly, books for reference.	Bachelors	>11 years	Cal Poly Retail Nursery Training Class could use this info.
Every day	All- a lot of ants	Yes	None	Yes	Tomorrow	Dept manager	Gophers		Some college	6-10 years	
multiple times per day.	All- Kikuyu grass	Yes	Vertebrates	Yes	Tomorrow	Corporate Office	gophers, mole, ground squirrel control		Some college	1-5 years	
multiple times per day.	insects, plant diseases- a	Yes	Weeds	Yes	Tomorrow	I do, dept manager, store manager			Bachelors	>11 years	
Every day	Insects- aphids and thrips	Yes	Vertebrates	Yes	Tomorrow	I do			High school	6-10 years	
multiple times per day.	insects, plant diseases- a	Yes	Vertebrates	Yes	Tomorrow	store manager	More insect id	Sanitation of gardening tools, water quality issues.	Some college	>11 years	

Appendix D-2. Summary of comments from course evaluations from Maintenance Gardener Trainings in San Luis Obispo County in 2010.

Questions asked at all workshops as part of the evaluation process

- **Topics to add:**
- **What pests do customers ask about most often:**
- **Other comments:**

Comments from Spring Workshops – Vertebrate Pest Control

March16 – Paso Robles

Topics to add: disease control, lawn disease and weeds; traps, lawn weeds; insecticides; lawn diseases, seasonal issues-timing of necessary apps; weed id ornamental and fruit tree diseases; learn identify diseases; pesticides, poisons; diseases; gardening problems with home landscaping, roses, and such; information on deer, application of pesticides, fungicides; plants and disease, lawns; pesticides, poisons

What pests do customers ask about most often: Not asked

Other comments:

nice instructors; very good meeting; none; I do thanks to the personnel of the SLO County for their help educating us. Thanks every body; [can't read comment]; I work for an apartment complex and we have people around all the time so the safest way to tread for pest is very important for me; continue with more information; continue holding workshops to learn more about application of effective traps and baits ; I like (?) and learn more and training; [can't read comment]

March 17 – San Luis Obispo

Topics to add: pruning, trimming, planting bushes, lawn seeding, mow and edging techniques; other pests and diseases of plants, rust, mildew; pruning plants for best disease control

What pests do customers ask about most often: weeds (5), insects (5), vertebrates (7), plant diseases (8)

Other comments: good training, very good trap

March 18 – Arroyo Grande

Topics to add: weeds, turf grass care; diseases on plants; various bating techniques for different rodents gopher black hole trap, squirrel-drown them in water, is that humane?; broadleaf in lawns

What pests do customers ask about most often: weeds (5), vertebrates (6), plant diseases (5); insects (3);

Other comments:

Summer Workshops – Weed Control

June 22 – Paso Robles

Topics to add:

What pests do customers ask about most often: Insects (3); plant diseases; (4) weeds (3); vertebrates (2)

Other comments:

June 23 – San Luis Obispo

Topics to add:

What pests do customers ask about most often: insects (5), plant diseases (6); weeds (8), vertebrates (2)

Other comments:

June 24 – Arroyo Grande

Topics to add: irrigation/waterwise drip system; irrigation control; what herbicides to use; diseased plants; more about plants and their diseases; types of pesticides, and how to get rid of gophers-how to kill insects; irrigation systems; how to control diseases on roses; irrigation systems

What pests do customers ask about most often: weeds (12), insects (5), plant diseases (8); vertebrates (5),

Other comments:

thank you for giving us this opportunity; excellent!; thank you for the good and useful information; When is the best time to apply fertilizers, in the am, noon, or pm thank- you; thank you for the time, what you said is very important; thank you - the whole group understands a lot more now; everything was fine-even the time was good

Comments from Fall Workshops

September 14 – Paso Robles

Topics to add:

What pests do customers ask about most often: weeds (4), insects(3), vertebrates (3), plant diseases(4)

Other comments: thank you very much for the information

September 15 – San Luis Obispo

Topics to add: Wasps; pesticide options (new products) and pesticide free options; grows on the lawn

What pests do customers ask about most often: vertebrates (5), plant diseases (7); weeds (6), insects (8)

Other comments: thank you, I thought the lecture was very thourough; nice work; Thanks for the freebees and munchies too!; Thanks so much for the plant ID guide. I've been wanting one.; espero lo hagan mas seguido; todo esto es muy importante para nosotros es por esos que se agruece

September 16 – Arroyo Grande

Topics to add: use of chemicals; control de rocso; tratamiento do problemas abioticas en plantas

What pests do customers ask about most often: plant diseases (2); weeds (2), insects (1), vertebrates (1)

Other comments: Gracias; todo de esta bien; darle las ? Por este tipo de informacion que mui ? Mas que la comportan con nosotros grutis ?

POST PROJECT INTERVIEWS - RETAIL NURSERY PARTICIPANTS (Questions follow)

Retail Nursery IPM Training Results - 17 of 21 participants interviewed
Ten of 17 of the respondents no longer work in the nursery department, or at the retailer.

Participating nurseries included:

Miner's Ace Hardware Arroyo Grande

Miner's Ace Hardware Grover Beach

Miner's Ace Hardware Atascadero

Miner's Ace Hardware Morro Bay

Miner's Ace Hardware San Luis Obispo

Los Osos Valley Nursery

Farm Supply Arroyo Grande

Farm Supply San Luis Obispo

Golden Hills Garden Center

Cambria Nursery

K-mart

Educated Gardener

Questions: In regards to the IPM Training that you received as a Retail Nursery:

1. Did this training cause you to change how you answer pest related questions (n=7)?
    a. 3 said yes.
    b. 4 said no. They were already doing things correctly. Some were more uncomfortable answering questions. Some do not carry pest control products so it was irrelevant.
2. Did you adjust any products that you sell based on this training (n=7)?
    a. 1 said yes. Some added more mulches and weed barriers, some more traps.
    b. 6 said no. They had no control over inventory. They were already carrying products that the training recommended.
3. Are you finding that customers are more receptive to pesticide alternatives(n=7)?
    a. 2 said yes. In general that seemed to be where people were headed for concerns regarding pets/children/wildlife.
    b. 5 said no. This question was not relevant for them. Customers seem to have a mind set of what they are looking for when they walk in.

4. Have people asked specifically for these options(n=7)?
    a. 1 said yes. For pets/wildlife/children.
    b. 6 said no. People seem to rely on what was recommended or worked in the past, more concerned with instant results.
5. Have you noticed any changes in what people are purchasing? (May have asked the wrong question)
    a. 1 said yes. People seem to be asking more questions
    b. 6 said no.
6. Are there areas for which you would like to see future trainings?
    a. Organic
    b. Controlling pests at all stages
    c. Continual IPM Training
7. How can we help to get consumers to use less toxic options?
    a. Post fliers and brochures.
    b. Promote the UC website.

Additional feedback:

"There never seems to be any follow up, a program like this will start, and then it fizzles out and nothing ever happens with it."

"Nurseries want to know what the county is getting out of this, what are the end results, what did you learn?"

Regarding the training that you received last January:

1. Cause you to change how you would answer pest related questions?

2. Did you adjust any products that you sell based on the training?

3. Are you finding that customers are more receptive to pesticide alternatives?

4. Have people asked specifically for these options?

5. Have you noticed any changes in what people are purchasing?

6. Are there areas that you would like to see future trainings on?

7. How can we help to get consumers to use less toxic options?

POST PROJECT INTERVIEWS - Maintenance Gardeners Participants (Questions follow)
Responses from 25 of 76 participants

Regarding the training that you received on (Vertebrate, Weeds, Insects, and Diseases):

1. Have you made any changes to how you control pests? Why or why not (n=25)?
    a. 53% - Yes
        i. As a result of the class I use less pesticides
        ii. Greater awareness of pesticide toxicity- use less toxic pesticides
        iii. Working with natural enemies vs. using pesticides
        iv. Reduced use because of training
        v. ***2*** people said that they identified their spray equipment and had made changes based on learning about safety
        vi. Stopped using pesticides entirely
        vii. More observant of interactions
        viii. Trained employees
    b. 47% - No
        i. 57% of these said no because they were not currently working
        ii. No changes, as there were no changes to be made, doing things correctly.
        iii. The training did not affect how the customers wanted the work done.
        iv. Did not apply many pesticides to begin with.
2. Where do you purchase your pest control products (n=25)?
    a. 21% Home Depot
    b. 13% Ewing Irrigation
    c. 13% Miner's Ace Hardware
    d. 1% Abaten
    e. 30% Farm Supply
    f. 17% John Deere
    g. 4% Wal-Mart
    h. 1% Permaculture
3. Is it easy to find the pest control products you need (n=25)?
    a. 73%-Yes
    b. 27%-No
        i. There is a language barrier
        ii. Only conventional chemicals not softer options
        iii. Don't know where to get safer products
        iv. Not easy to ask questions sometimes
4. Do your customers appreciate you using safer options (n=25)?
    a. 67%-Yes
    b. 7%-Some do
    c. 26%-No
5. What further trainings should be provided?
    a. Insects on fruit trees

b. Pest control in ornamental trees
c. Reading labels and understanding rates
d. How to apply less products
e. Green gardening
f. Gopher and mole control
g. 8% wanted more on weed control
h. Care of roses
i. 8% wanted more on lawn care and maintenance
j. Need more info on products such as Turflon, Fusalate, and Ronstar
k. Regulations, it is nice to know first hand
l. Soil identification and testing
m. Mulching
n. Installation classes
o. Alternatives to round-up
p. Emergency information
q. Equipment- noise and air pollution
r. 24% said that any additional training would be greatly appreciated.

6. Is there anything else we could do to help you use safer options?
    a. Post fliers
    b. Hold meetings
    c. Retail staff are helpful
    d. Many suggested this- Inform/educate homeowners
    e. Provide customers with a list of safe options
    f. Many suggested this- Bring customers and Gardeners together
    g. All agreed that it was important to keep providing the workshops.

Regarding the training that you received on (Vertebrate, Weeds, Insects and Diseases) :

1. Have you made any changes to how you control pests?
    a. Why or why not?

2. Where do you purchase your pest control products?

3. Is it easy to find the pest control products you need?

4. Do your customers appreciate you using safer options?

5. What further trainings could we provide you with?

6. Is there anything else we could do to help you use safer options?

Appendix F
Current Pest Management Practices Form

Insect/Mite Control:

1. **Aphids** – on ornamental, flowering, and/or fruiting plants in landscapes.
   - Frequency of occurrence- spring, summer, fall.
   - Damage- piercing and sucking of plant material, production of "honeydew" and sooty mold.
   - Percentage of landscapes infested- eighty percent.
   - Critical timing of control measures- when pest pressures exceed acceptable levels.

   Chemical Controls:
   - Products- Active ingredients: Malathion- Organophosphate, Orthene- Acephate, Merit- Imidacloprid, and Pest Fighter- Pyrethrins.
   - Application is usually done with hand held sprayers. Spraying is done for nuisance or aesthetic reasons and may be done two to five times per season.

   Alternatives:
   - Horticultural oil, neem oil, horticultural soap, repellent sprays containing garlic.

   Cultural Control Practices:
   - Give plants enough space and air flow.
   - Provide proper water and nutrients- (use slow release fertilizers to reduce nitrogen levels in plants).
   - Water applied to foliage with pressurized spray nozzle to knock aphid off.
   - Select plant material that is resistant to aphids.
   - Control ants- deny access to plants.
   - Include plants in landscape that attract beneficials such as lady bugs and lacewings.

   Biological Controls:
   - Ladybugs, parasitic wasps, lacewings, praying mantis, and fungal pathogens.
   - Spot treat only heavy infestations of pest to leave a reservoir of food for natural enemies.

2. **White fly** – on ornamental, flowering, and/or fruiting plants in landscapes.
   - Frequency of occurrence- spring, summer, fall.
   - Damage- piercing and sucking of leaves, unsightly white powder or "hairy" exudates and/or the production of "honeydew" and sooty mold.
   - Percentage of landscapes infested- thirty to forty percent
   - Critical timing of control measures- when pest first appears.

   Chemical Controls:
   - Products- Active ingredients: Malathion- Organophosphate, Orthene- Acephate, and Merit- Imidacloprid.
   - Application is usually with hand held sprayers. Spraying is done for nuisance or aesthetic reasons and may be done two to five times per season.

Alternatives:
- Horticultural oil, neem oil, and horticultural soap.

Cultural Control Practices:
- Give plants adequate light, enough space for air flow.
- Provide proper water and nutrients- (use slow release fertilizers to reduce nitrogen levels in plants).
- Yellow sticky traps should be used to monitor.
- Appropriate plant choices should be made with the awareness that some plants seem to attract whitefly. If insects become established, plants should be pruned and the infested plant parts should be bagged, also remove older leaves to remove young whitefly stages.
- Control ants- deny access to plants.
- Plants can by syringed, (sprayed off with a strong stream of water).
- Include plants in landscape that attract beneficials such as lady bugs and lacewings.

Biological Controls:
- Parasitic wasps and lacewings.

3. **Scale** – trees, shrubs and perennials in landscapes.
   - Frequency of occurrence- spring, summer, fall.
   - Damage- piercing and sucking of plant material, weaken or kill the plant, and the production of "honeydew" and sooty mold.
   - Percentage of landscapes infested- eighty percent
   - Critical timing of control measures- when pest pressures exceed acceptable levels.

   Chemical Controls:
   - Products- Active ingredients: Malathion- Organophosphate, Orthene- Acephate, and Merit- Imidacloprid, Sevin- Carbaryl, and Pest Fighter- Pyrethrins.
   - Application is usually with hand held sprayers. Spraying is done for nuisance or aesthetic reasons and may be done two to five times per season.

   Alternatives:
   - Horticultural oil, neem oil, repellent sprays containing garlic, and horticultural soap.

   Cultural Control Practices:
   - Give plants adequate light, enough space for air flow.
   - Provide proper water and nutrients- (use slow release fertilizers to reduce nitrogen levels in plants).
   - Control ants- deny access to plants.
   - Control dust on foliage.
   - Include plants in landscape that attract beneficials such as lady bugs and lacewings.

   Biological Controls:
   - Parasitic wasps, ladybird beetles, and lacewings.

4. **Caterpillars** – on landscape plants.
   - Frequency of occurrence- spring, summer, fall.
   - Damage- they eat holes in leaves, flowers, and fruit.
   - Percentage of landscapes infested- fifty percent or more per season.
   - Critical timing of control measures- when infestation first starts.

   Chemical Controls:
   - Products- Active ingredients: Sevin- Carbaryl, Orthene- Acephate, Bayer Advance Multi Insect- Cyflurilin, Bacillus thuringiensis- (B.T.s), and Spinosad.
   - Application is usually with hand held sprayers. Spraying is done for nuisance or aesthetic reasons and may be done two to five times per season.

   Alternatives:
   - B.T. and Spinosad are softer chemicals. Hand removal of small infestations.

   Cultural Control Practices:
   - Give plants adequate space.
   - Provide proper water and nutrients.
   - Appropriate plant choices should be made with the awareness that some plants have more problems with these pests.
   - Crop rotations or companion planting along with insectary plantings.

   Biological Controls:
   - Birds could be encouraged.
   - Pheromone traps are available for Codling moth.
   - Placing bat houses will minimize the adult stage of the nocturnal pests.

Weed Control:

1. The two most common weeds in landscapes are crab grass and oxalis. They occur in turf and other landscape areas.
   - Frequency of occurrence- seasonal, spring, summer, and fall.
   - Damage- aesthetic and also over time they will push out the desirable plants.
   - Percentage of landscapes infested- fifty to seventy-five percent of landscapes.
   - Critical timing of control measures- pre-emergence of seed or post emergence of small weeds.

   Chemical Controls:
   - Products- Active ingredients: Trimec Plus- 2, 4-D Dimethylamine salt, Cool Power- 2-Methyl-4-Cholorphenoxyacetic acid of Isooetyl ester, Butoxyethanol Ester of 3, 5, 6-trichloro-2-Pyridinloxyacetic acid, and Dicamba, Turflon- 2, 4-D Dimethylamine salt and Diethanolamine salt of 2, 4-D, MCPA- Dimehtylamine salt, and Round-up- Glyphosate.
   - Application is usually with hand held equipment. Applied for economic, nuisance, and aesthetic control. May be applied two to four times per season.

   Alternatives:
   - Corn gluten for pre-emergent control.

- Organic herbicides that contain clove oil, acetic acid, or lemon oil for post-emergent control.

Cultural Control Practices:
- Hand removal of small weeds.
- Use of mulch
- Apply correct amounts of fertilizer and water to help landscape out compete weeds.
- Hoe weeds out of the landscape. Be sure to remove weeds before they go to seed.
- Use weed flamers for cracks and crevices in sidewalks.
- In larger areas, sheep or other herbivores could be used.

Biological Controls:
- Some weed pests do have parasitic beneficials available, however not the above mentioned weeds.

Other Issues:
- There is on going research at the private and university levels to reduce pesticide use.

Disease Control:

1. Powdery mildew and rusts are the two most common diseases that maintenance gardeners ask about.
   - Frequency of occurrence- year round with spring and summer being the heaviest period of occurrence.
   - Damage- aesthetic and in some cases death of the plant.
   - Percentage of landscapes infested- fifty percent of landscapes.
   - Critical timing of control measures- before or at earliest stage of disease.

Chemical Controls:
- Products- Active ingredients: Ortho Rose Pride- Triflorine and Bayer all in One Rose and Flower Care- Tebuconazole.
- Application is usually with hand held equipment for both aesthetic and nuisance control. May be applied four to six times per season.

Alternatives:
- Horticultural oils or soaps, and neem oil.

Cultural Control Practices:
- Plant resistant varieties.
- Give plants adequate space.
- Increase air flow by leaf pulling or pruning
- Do not over fertilize or over water.
- Proper pruning and mulching will help reduce spore populations. Remove infested leaves.
- Use antitranspirants which control disease by forming a barrier between disease spores and plant tissues.

Biological Controls:
- The potential for using natural enemies to control powdery mildew is under study.

Other Issues:
- Baking soda bicarbonate of soda to control powdery mildew is being researched in Japan and Great Britain. (W. Olkowski, H. Olkowski, and Daar 1995).
- California vineyards are researching the use of compost tea to suppress powdery mildew as well.

Rodent Control:

1. Ground squirrels and pocket gophers are the two biggest rodent problems in the landscape.
   - Frequency of occurrence- year round with spring, summer, and early fall being the worst.
   - Damage- destruction of landscape plants, holes, and burrows in landscape areas.
   - Percentage of landscapes infested- eighty percent of landscapes have some degree of infestation.
   - Critical timing of control measures- when pests first appear. However if they are not controlled immediately and populations become high, then the appropriate tactics should be used based on the time of year.

Chemical Controls:
- Products- Active ingredients: Wilco Ground Squirrel Bait- Diphacinon for squirrels, Wilco Gopher Bait and Cooke Gopher Bait- Strychnine and Uncle Sweeny's Poison Pellets (with peanut protein)- Zinc Phosphide bait for gophers.
- Baits are applied by hand either to burrows or in bait stations per label directions. They are used for nuisance pests. Typical number of applications could be two to ten depending on number of animals.

Alternatives:
- Fumigating is an option.
- Products that contain castor bean oil as a repellent.
- Some plant materials can also deter rodents.
- Using cinch or other rodent traps can be effective.
- The "Rodenator" can be used very effectively for small areas and not around buildings.
- Sonic gopher controllers can be used to deter pest populations.

Cultural Control Practices:
- Gopher baskets at planting, use of fencing and barrier material.
- Eliminating habitat areas such as brush and rock piles.

Biological Controls:
- Encourage predatory animals such as owls or hawks by providing nesting and perching sites.
- Also allowing snakes to inhabit yards.

Other Issues:
- Large populations my spread diseases, important to keep numbers down.

- On going research at the university level.

Nematode Control:
Maintenance Gardeners are rarely aware of or address nematode pests.

Key Contacts:
- Mary Bianchi, University of California Farm Advisor, San Luis Obispo
- Cheryl A.Wilen, Ph.D., Area IPM Advisor, UC Statewide IPM Projects
- Mary Louise Flint, PhD, Director, IPM Education & Publications & CE Specialist, UC Statewide IPM Projects
- David Headrick, Professor, California Polytechnic State University, San Luis Obispo
- Green Gardener Program: Santa Barbara and Monterey Counties

Appendix G.

FLOW CHART

INTEGRATED PEST MANAGEMENT CONTINUING EDUCATION FOR MAINTENANCE GARDENERS

Management Team, Team Partners and Collaborators

Management Team Members	**Responsibilities**
Tamara Kleemann, Agricultural Inspector/Biologist, IPM Coordinator, San Luis Obispo County	Grant administration, coordinate project implementation
Dave Headrick, Professor, Horticulture and Crops Science Department, California Polytechnic State University.	Assistance with development of curricula and outreach
Terry Vassey, Horticulture and Crops Science Department, California Polytechnic State University and VP Education, San Luis Obispo Chapter of California Landscape Contractors Association.	Assistance with development of curricula and outreach
Judy Letterman, Pesticide Applicators Professional Association (PAPA)	Assistance in planning and outreach
Mary Bianchi, San Luis Obispo County UCCE Farm Advisor. Project liaison with the Statewide UC IPM Program.	Development of curricula, workshop format, presenter, and project implementation
Team Partners	
Suzanne McCaslin, Pest Control Advisor, Farm Supply Company of San Luis Obispo	Provide facilities for workshops, assistance with development of curricula, and outreach, presenter
Osvaldo Olmos, Environmental Health Coordinator, Environmental Center of San Luis Obispo,(ECOSLO).	Assistance with development of curricula and outreach, Spanish language presenter, translation of materials
Collaborators	
Cheryl Wilen, Ph.D., Area IPM Advisor, UC Statewide IPM Program	Assistance with development of curricula, presenter
Mary Louise Flint, Ph.D., Associate Director for Urban and Community IPM, UC Statewide IPM Program and Extension Entomology Department, UC Davis	Liaison for UCIPM Resources
Dale Norrington, Peer Trainer, San Luis Obispo County	Participation at workshops as peer trainer
Amy Breschini, Agricultural Technician, UCCE, San Luis Obispo County	Assistance and preparation of materials for workshops, presenter
Janice Campbell, Deputy Agricultural Commissioner, San Luis Obispo County	Assistance with grant administration, media contact

Laura Hebert, Agricultural Inspector/Biologist , San Luis Obispo County	Assistance and preparation of materials for workshops, preparation of curricula materials in PowerPoint for dissemination, presenter,
Manuel Mendoza, Agricultural Technician, San Luis Obispo County	Assistance in Spanish translation of materials and follow up correspondence with Spanish speakers.
Edwin Moscoso, Agricultural Inspector /Biologist, San Luis Obispo County	Assistance in Spanish translation of materials and Spanish language presenter
Kate O'Reilly, Agricultural Technician, San Luis Obispo County	Assistance with filming and preparation of video for curricula materials.

Appendix H. Powerpoint resources for Retail and Maintenance Gardener Workshops

IPM Education for Retail Employees Who Sell Pesticides - How to Help Customers Find the Least Toxic Solutions

Educación de Programa de Manejo Integrado de Plagas(IPM) para empleados que venden plaguicidas - Cómo ayudar a los clientes a encontrar las soluciones menos tóxicas

Weed Control in Lawns

Control de Malezas en el Césped

Vertebrate Pest Control

Control de Plagas Vertebradas

Disease and Insect Control

Enfermedades y Control de Plagas