Module #4
Management of High-Use Sports Turfgrass

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Session Topics

- Maintenance issues
- Drought impact and management response
- Management requirements
  - Fertilizing, weed control, etc…
- Potential impacts of management on water quality

Maintenance Issues with Sports Turf Fields

Maintenance Issues

- Neglect in the off-season
- Over irrigation and/or nitrogen fertilization during hot summer months
- Failure to aerate regularly
- Failure to dethatch at the appropriate time
- Excessive carrying capacity

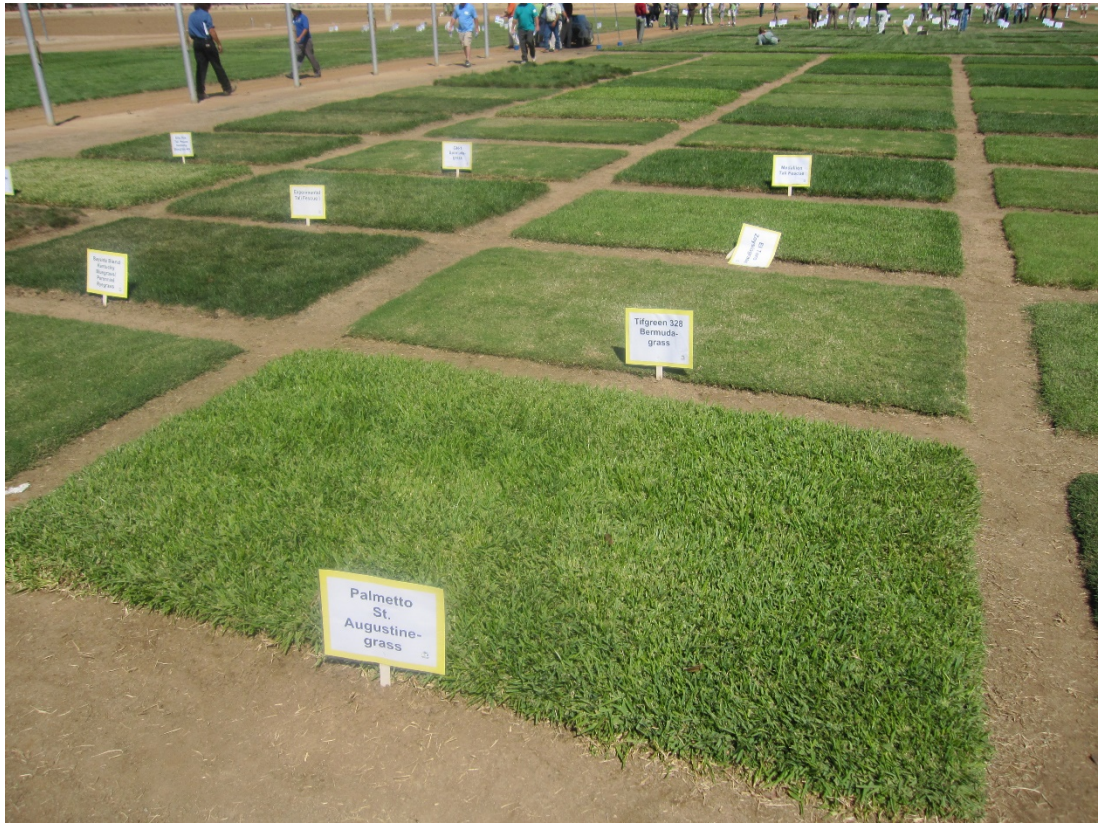
Drought Impact and Management Responses

Drought Impacts and Management Response

- Water allocations reduced
- Frequency of irrigation limited to specific days of the week
- Quality of turf impacted by both under most circumstances

Drought Impacts and Management Response

- University of California Riverside Turf Breeding Program
  - Improved drought and heat tolerance
  - Maintaining aesthetic value (i.e. year-round green color)



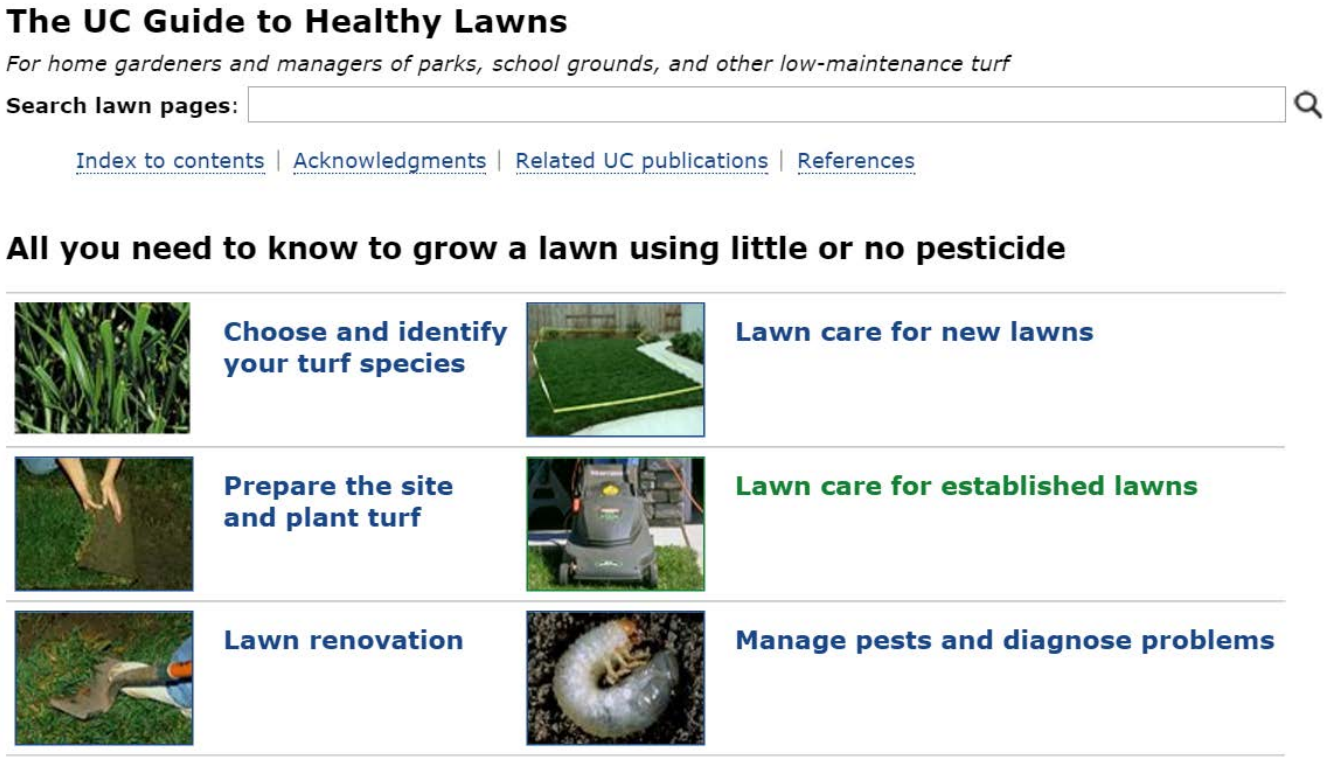
Drought Impacts and Management Response

- Replace with artificial turf
  - Must still be washed periodically
  - Cooled on hot summer days
  - UCLA replaced 11-acre intramural field at UCLA to save as much as 6.5 million gallons annually
- Install sensors in soil to monitor moisture, salinity, etc…
  - Dodger stadium installed sensors to fine-tune irrigation

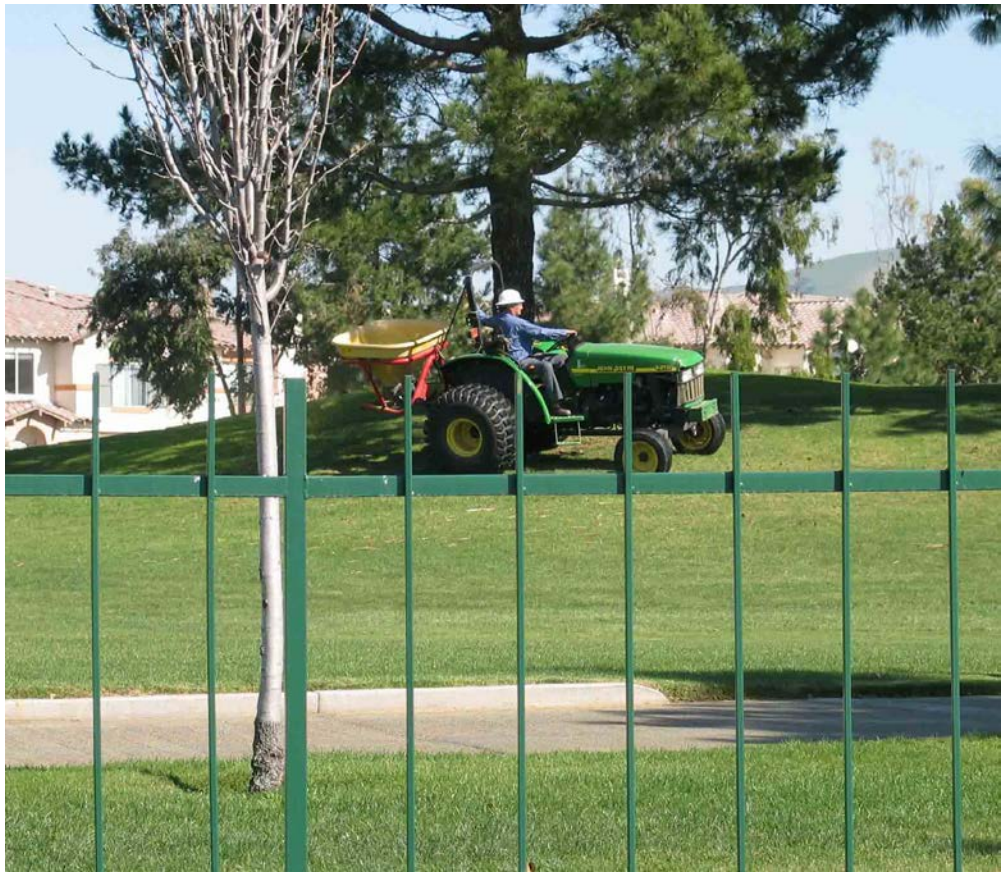
Management Requirements for Athletic Fields

Management Req. for Athletic Fields

- UC Guide for Healthy Lawns
  - Mowing
  - Irrigating
  - Fertilizing
  - Dethatching
  - Aerating
  - Weed Control



Fertilizing



- More frequent applications
- Higher N application rates to encourage faster growth to repair damage from foot traffic
- Sandy soils versus clay soils
  - More frequent but lower rates on sandy soils
- Fast-release, slow-release, and natural organic

Fast Release Soluble Fertilizers

Fast Release soluble nitrogen (N) fertilizers	Analysis (% N-P-K)	Amount needed to apply 1 lb actual N/1,000 sq ft (lb, approx.)	Amount needed to apply 0.5 kg actual N/100 sq m (kg, approx.)	Relative cost/lb of actual N	Remarks
ammonium nitrate	33-0-0	3.0	1.5	low	Can burn. Contains immediately available nitrate. Used for winter nitrogen fertilization.
ammonium phosphate sulfate	16-20-0	6.0	3.0	low	Used mainly as a preplant fertilizer for soil incorporation.
ammonium sulfate	21-0-0	5.0	2.5	low	Acidic soil reaction. Can burn turf if over overapplied.
calcium nitrate	15.5-0-0	6.5	3.3	low	Quickly available. Can burn turf. Used for winter fertilizer.
urea	45-0-0	2.0	1.0	low	Converts quickly in soil to available ammonium nitrogen. Very high burn potential.

Slow Release Fertilizers

Slow-release fertilizers	% N				
coated/soluble fertilizer	varies	varies*	varies*	high	Foot traffic and mowing equipment may crush coated fertilizer and destroy slow-release properties, especially on putting greens.
ESN (neutralized ionic elastomers)	varies	varies*	varies*	high	Coating is semipermeable, allowing release of dissolved ureas through membrane for up to 6 months.
IBDU (isobutyl-enediurea)	varies	varies*	varies*	high	Nitrogen released by slowly dissolving in soil water. Long-lasting response.
methylene-urea	varies	varies*	varies*	high	Similar to UF but quicker nitrogen release.
polymer-coated ureas	varies	varies*	varies*	high	More controlled release than SCU with addition of plastic to sulfur coat.
sulfur-coated urea	32–41	2.5–3.0	1.3–1.5	moderate	Release can be up to 16 weeks for some formulations.
UF (ureaform)	38	3.0	1.5	high	Nitrogen released by soil microorganisms. Poor winter release; faster summer release.

NOTE: * Follow manufacturer's recommendations for application rates.

Natural Organic Materials & Fertilizers

Natural organic materials and fertilizers	% N				
activated biosolids (sewage sludge)	4–7	20	10	high	Significant phosphorus and moderate nitrogen; some potassium present.
digested biosolids sludge)	1.5–3	40	20	high	Low nitrogen availability; some (sewage phosphorus present.
poultry manure	3–4	30	15	high	Good source of nitrogen, phosphorus. Odor may be rather strong.
steer manure	2	50	25	high	Low nitrogen, good source of phosphorus and potassium, but not a favored turf weed fertilizer. May introduce weed seeds and/or increase salinity.

Fertilizer Application Frequency

Turfgrass type	Months to apply fertilizer											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Southern California												
warm-season				X†	X				X	X		
cool-season			X		X					X	X†	

† This is the best time to apply a complete fertilizer (containing N, P, and K), if necessary.

Water Quality Concerns - Fertilizing

- Over-irrigation when watering-in
- Off-site application using cyclone or rotary spreaders
- Applications directly into landscape drains
- Combination “weed and feed” products might add unnecessary nutrients and herbicides to turf and potentially runoff

Aerating

- One of most important components of maintenance program
- Movement of oxygen, nutrients, and water occurs in compacted soils
  - Decrease in drought resistance
  - More susceptible to disease and insect damage
- Aerate when turf is actively growing

Aerating

- High use turf will need to be aerated several times a year
- Sandy soils should need less than clay soils
- Be careful of aerating in high temperatures as damage may occur

Dethatching

- Layer of living and dead stems, roots, stolons, rhizomes
  - Thin layer is beneficial
  - Thick layer inhibits water, air, and nutrients from reaching the soil
- Thick thatch promotes disease and provides environment for insect pests

Dethatching

- General rule is to dethatch if thatch is greater than ½”
- Best to perform mid-to late spring or early fall
- Frequency increases when turf is overwatered, overfertilized, and on heavy soils
- Dethatching when weed seeds are present may result in weed invasion into turf

Carrying Capacity of Sports Fields

- Keep records of use and compare to field appearance
- Develop special zones for conditioning drills and other practice sessions
- Portable goals can increase the amount of uses before area becomes unplayable

Pest Management of High-Use Sports Facilities

Control of Burrowing Rodents in High Use Turfgrass Facitilies

Control of Burrowing Rodents

- Trapping
  - Not conducive in sports fields
- Repellants
  - Ineffective
- Toxicants
  - Anticoagulant rodenticide
  - Zinc phosphide
- Fumigation
  - Carbon monoxide
  - Aluminum phosphide
  - Gas cartridges (not effective)
- Burrow Modification
  - Physical methods

Weed Control in High Use Situations

Weed Control

- Proper identification is critical
- Correct cultural practices contributing to weed invasion
  - Compaction from over use
  - Overwatering
  - Mowing height

Prominent Weeds

Clover

Plantain

Yarrow

Minor Varieties

- Burclover
- Creeping woodsorrel
- Dallis grass
- Dandelion
- Dichondra
- Annual bluegrass
- Nutsedge
- Oxalis
- Scarlet Pimpernel
- Swinecress

Weed Identification

Identification key to weeds

Use this key to identify your weed species

This key includes the most common weeds found in California lawns. Other species may occur but are not of major importance in turf. Because flowering parts are often mowed and not seen in turf, this key was developed using vegetative characteristics. Identifying weed species is essential for choosing appropriate management practices.

- Click on illustrations that resemble your weed.
- Work through the key until you get to a summary page of your weed.
- Link to Pest Notes from many summary pages to see specific management practices.

Begin key

Identification tips

- Distinguishing broadleaves, grasses, and sedges
- Grasses
- Sedges
- Broadleaves

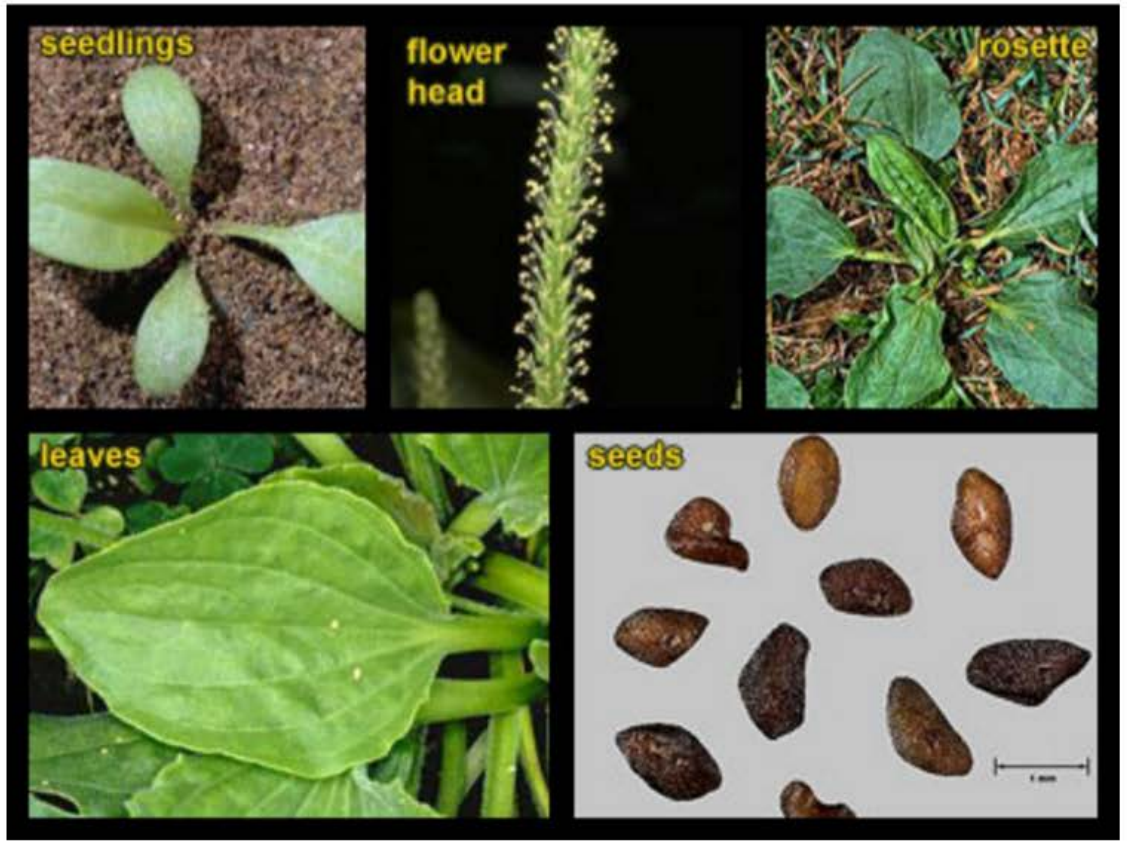
Already know your weed problem? Go directly to your species:

- Weeds in key

Broadleaf plantain (*Plantago major*)

Click on images to enlarge

Broadleaf plantain is a perennial broadleaf plant that infrequently behaves as an annual or biennial. Members of the plantain family have basal rosettes of leaves and leafless spikes of inconspicuous flowers. It is found throughout California to 7200 feet (2200 m), except for the Sierra Nevada region and deserts. Like many weeds it inhabits disturbed areas such as agricultural land and other disturbed places.

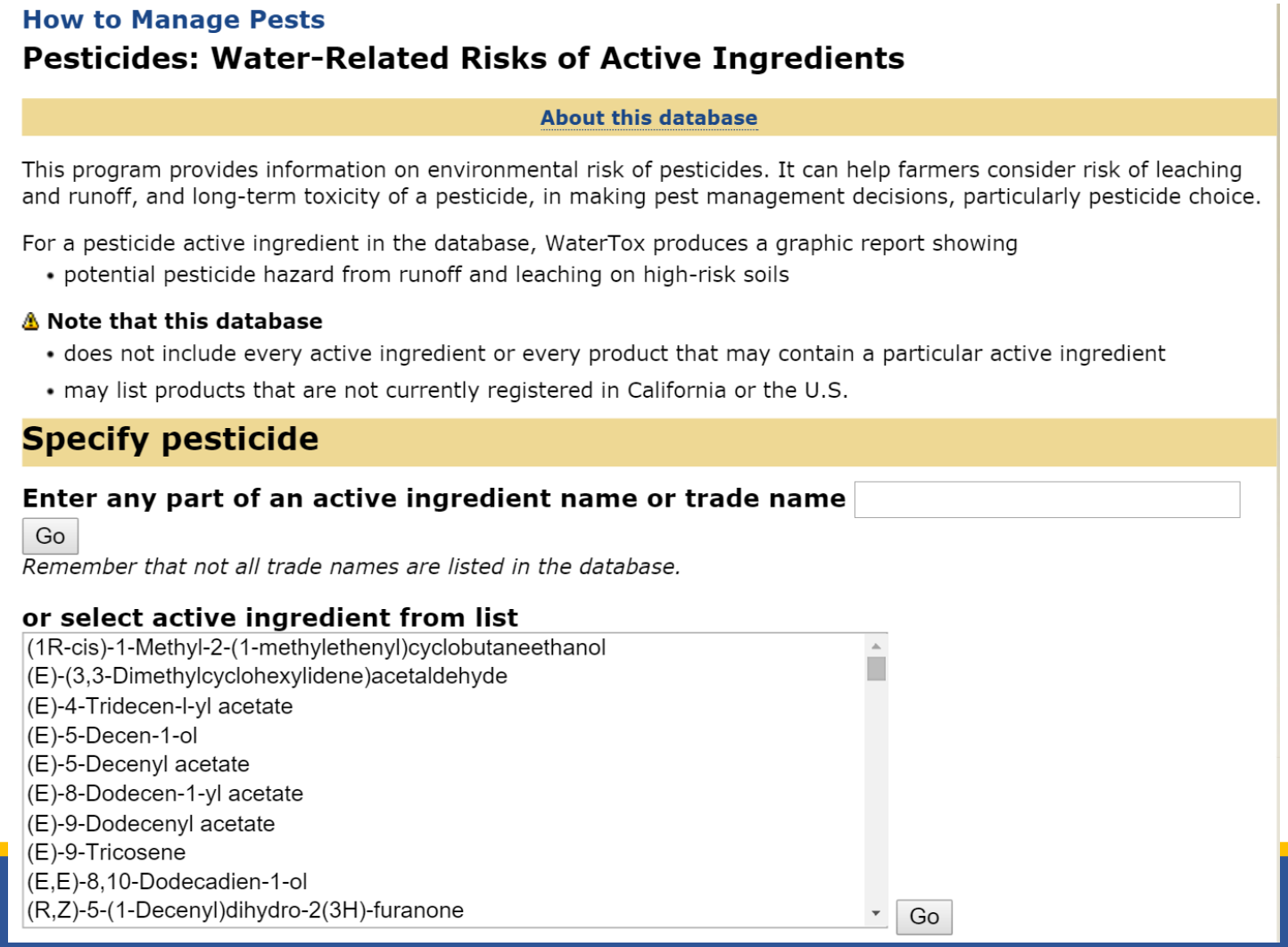


Habitat

Vineyards, orchards, gardens, urban sites, landscaped areas, footpaths, roadsides, and other disturbed locations. It can be found it compacted and soggy sites where other plants may not thrive.

Weed Identification in the Field

Water Quality Impacts of Pesticides



How to Manage Pests

Pesticides: Water-Related Risks of Active Ingredients

About this database

This program provides information on environmental risk of pesticides. It can help farmers consider risk of leaching and runoff, and long-term toxicity of a pesticide, in making pest management decisions, particularly pesticide choice.

For a pesticide active ingredient in the database, WaterTox produces a graphic report showing

- potential pesticide hazard from runoff and leaching on high-risk soils

⚠ Note that this database

- does not include every active ingredient or every product that may contain a particular active ingredient
- may list products that are not currently registered in California or the U.S.

Specify pesticide

Enter any part of an active ingredient name or trade name

Go

Remember that not all trade names are listed in the database.

or select active ingredient from list

(1R-cis)-1-Methyl-2-(1-methylethenyl)cyclobutaneethanol
(E)-(3,3-Dimethylcyclohexylidene)acetaldehyde
(E)-4-Tridecen-l-yl acetate
(E)-5-Decen-1-ol
(E)-5-Decenyl acetate
(E)-8-Dodecen-1-yl acetate
(E)-9-Dodecenyl acetate
(E)-9-Tricosene
(E,E)-8,10-Dodecadien-1-ol
(R,Z)-5-(1-Decenyl)dihydro-2(3H)-furanone

Go

UC IPM WaterTox: Water-Related Risks of Active Ingredients

Active ingredient: Oxadiazon

Values for active ingredient applied under these general conditions:

See detail
- Table
- Data file

Report

Site conditions

- soil highly susceptible to pesticide movement
- high probability of rainfall expected within 7-10 days of pesticide application
- low-efficiency irrigation expected within 7-10 days of pesticide application
- no residue management

Application conditions

- application to more than 50% of the field
- surface applied
- more than 1/4 pound AI per acre

⚠ **Application rate, method, and site conditions may not be typical for this crop.**
To change these conditions to match your own, see below.

Potential Pesticide Hazard on High-Risk Soils					
Fish (Long-term)			Human (Long-term)		
Leaching	Adsorbed runoff	Solution runoff	Leaching	Solution runoff	pH
H	L	H	H	H	n/a

No mitigation measures needed Mitigation measures may be needed

Session #5: Selecting Locally-Adapted Plants for Municipal Landscapes

March 23rd, 2016