Poor water management is probably the biggest cause of pest infestations. Learn the water requirements of plants and the water-holding properties of the soil at each location. Monitor soil moisture around the plant's root zone and adjust irrigation according to seasonal need. Maintain adequate but not excessive water in the soil to ensure plant survival and good growth. Too much or too little water damages or kills plants.

Insufficient water causes leaves to wilt, droop, and drop. Drought-stress promotes sunburn and sunscald, shoot and branch dieback, bark cracking, cankers, and some fungi. Beetles, mites, and chewing or sucking insects may attack drought-stressed plants.

Excess water, especially near the root collar, is a primary cause of root and crown diseases and increases weed populations. Poor placement of water also promotes some diseases. Splashing water spreads fungal spores and wet foliage promotes some foliar and fruit diseases, such as leaf spots, rusts, and brown rot. Use low-volume drip irrigation or mini-sprinklers instead of overhead sprinklers where feasible.

The first step in pest management is to identify the type and level of infestation of pests (pest scouting). See table this section for Estimated Simple Economic Threshold Levels for selected common insect pests of New Mexico.

Estimated Simple Economic Threshold Levels for selected common insect pests of New Mexico[1].

CROP	PEST	THRESHOLD LEVEL	NOTES
Alfalfa	Alfalfa weevil	15-20 larvae /sweep	Plant size dependent, foliar insecticide, normally 1st cutting only economic, not normally present in 1st year hay
Alfalfa	Alfalfa weevil	25% damaged stems (2 larvae/stem)	Plant size dependent, foliar insecticide, normally 1st cutting only economic, not normally present in 1st year hay
Alfalfa	Aphids (pea and blue aphid)	Greater than 15 per sweep	Plant size dependent, foliar insecticides, may be economic throughout the season, multiple generations per year, population increase following some insecticide applications
Chile	Pepper Weevil	Multiple individuals caught in pheromone trap	Economic threshold level is variety dependent; imported pest, multiple generations per year
Pecans	Pecan nut casebearer	3-5% egg infested clusters	Dependent on crop load and price, sample nut clusters, 3 generations per year
Pecans	Black pecan aphid	1 aphid per compound leaf	Sample compound leaves, foliar insecticides, multiple generations/year, do not tolerate heat

CROP	PEST	THRESHOLD LEVEL	NOTES
Pecans	Black margined aphid	25/compound leaf	Economic problem during a heavy production year
Onions	Thrips sp.	3-5/leaf	Individual plant samples, multiple generations per year
Cotton	Bollworm	5-10% larvae infested plants	Individual plant samples after boll development, 3 + generations/year, populations may migrate from drying corn
Cotton	Thrips	1-4/plant	Seedling pest, individual seedling sampled, normally use insecticide at planting, multiple generations
Cotton	Pink Bollworm	15% infested bolls	Consider days to harvest, multiple generations per year
Corn	Southwestern Corn borer	20% egg or larvae infested plants	Individual plant samples, two generations per year
Corn	Western Corn Rootworm Adults	5-7 adults per plant prior to brown silk	Individual plant samples, larvae controlled with at-planting insecticides, one generation per year
Corn	Western corn rootworm larvae	2nd year in corn and presence of adults the previous year	Larvae controlled with at-planting insecticides, one generation per year
Wheat	Aphids (green bug)	10/stem	Consider dry-land vs. irrigated, can be controlled with at-planting insecticide, multiple generations
Wheat	Russian Wheat Aphid	Determined by yield	50% infestation level result in 25% yield loss, foliar or controlled with at-planting insecticides, multiple generations
Grain Sorghum	Head worms (fall or earworm)	1.5-2 per head	Normally one generation in grain sorghum

CROP	PEST	THRESHOLD LEVEL	NOTES
Grain Sorghum	Green bugs	Growth stage dependent (physical damage present to leaf necrosis at later stages)	Leaf samples and plant observations
Green Beans	European corn borer	Present in the field	Sweep net samples after pod formation
Lettuce	Corn earworm	Less than 1% infested plant	Individual plant samples
Lettuce	Cabbage loopers and beet armyworms	Less than 5% infested plants	Individual plant samples

[1] **Excerpt from Practical Integrated Pest Management, Draft Developed and Presented by Brad Lewis, Research Entomologist, NMSU for NRCS Nutrient and Pest Management Training, 2002, NM Water Quality Tech Note 15, http://www.nm.nrcs.usda.gov/technical/tech-notes/Water/water15.doc**

Integrated pest management should be used when feasible; this would include biological, mechanical, and cultural controls (could also include judicious chemical control). Consider potential for spray drift when applying pesticides with sprinkler irrigation.

Pesticide applications associated with irrigation systems need to be applied according to Irrigation Water Management practice standard and Pest Management standards, http://www.nm.nrcs.usda.gov/technical/fotg/section-4/std-specs.html . The application rate (in/hr) for material applied through irrigation shall not exceed the water holding capacity of the soil root zone. Application amounts must be adjusted to match the soil intake rate.

In order to evaluate site-specific risks of pesticide application on a given field, the Windows Pesticide Screening Tool located at http://www.wsi.nrcs.usda.gov/products/W2Q/pest/pest_mgt.html with instructions at http://www.nm.nrcs.usda.gov/technical/tech-notes/Water/water9.doc needs to be run and the Pest Management Job Sheet filled out. This will help in evaluating the type of risk to surface and ground water and choosing an alternative NRCS conservation practice or management practice to reduce the risk, such as leaching, adsorption, and runoff practices (this section).

Conservation Treatment Technique Summary Guide for Pesticide Losses

Conservation Treatment:	Pesticide Loss Pathways[1]			Comments
	Leaching	Adsorption	Runoff	
Management Practices [2]				
Biological	++	++	++	Pesticide use can be reduced.
Cultural (planting dates)	++	++	++	Pesticide use can be reduced
Cultural (variety)	++	++	++	Pesticide use can be reduced
Formulation	+++	+	+	Less soluble pesticides move slower
Lower Application Rate	+++	++	++	Most effective with highly soluble pesticides
Mechanical (grubbing)	++	++	++	Pesticide use can be reduced
Mechanical (pruning)	++	++	++	Pesticide use can be reduced
Mechanical (roller chop)	++	++	++	Pesticide use can be reduced
Mechanical (tillage)	++	++	++	Pesticide use can be reduced
Mechanical (vacuum)	++	++	++	Pesticide use can be reduced
Mechanical (weeding)	++	++	++	Pesticide use can be reduced
Partial Substitution	+++	++	++	Use pesticides with lower environmental risk
Partial Treatment	++	+++	+++	Banding and directed spraying, most effective with strongly adsorbed pesticides
Scouting	+++	+++	+++	Required to identify pest to be controlled; apply pest management based on economic threshholds
Set-back	++	++	++	Greater distance from surface water and less inadvertent application to water body, greater distance to entry point
Soil Incorporation	+	++	++	Reduces amount of pesticides at the soil surface, reduces macropore flow
Timing of Application	+++	+++	+++	Pesticide losses decrease with time between application and storm events
Conservation Practices [3]				
Conservation Cover (327)	+	+++	+++	For use when land is retired from production
Conservation Crop Rotation (328)	++	+++	+++	Pesticide use can be reduced due to rotational effects on pest complex
Constructed Wetland	-	+	+++	Deposition of sediment and treatment of runoff; leaching can be expected below wetlands
Contour Buffer Strips		+++	+++	Control runoff and sediment losses
Contour Farming (330)		+	+	Infiltration improved, runoff reduced
Contour Orchard (331)		+	+	Control runoff and sediment losses somewhat

Conservation Treatment:	**Pesticide Loss Pathways**[1]			Comments
	Leaching	**Adsorption**	**Runoff**	
Management Practices [2]	+	++	+	Reduces transport of adsorbed pesticides
Cross Wind Trap Strips (589)		++		Reduces transport of adsorbed pesticides
Field Border (386)		+++	++	Buffer action reduces runoff and suspended sediment
Filter Strip (393)	+	+++	++	Reduces runoff, sediment deposited above filter strip
Forage Harvest Management (511)	++	+++	+++	Scheduling harvest periods effectively to control pests can reduce pesticide use.
Grade Stabilization Structure (410)		+++		Reduces mass movement of soil and adsorbed pesticides
Grassed Waterway (412)	+	++	+	Some trapping of adsorbed pesticides
Irrigation Land Leveling (464)	+	++		Reduction of suspended sediment and transport of adsorbed pesticides
Irrigation System Tail Water Recovery (447)	-	++	++	Reductions in runoff and suspended sediment
Irrigation Water Management (449)	++	+	+	Reductions in runoff and suspended sediment
Pasture and Hay Planting (512)	++	+++	+++	Rotation including perennial grasses and legumes generally require fewer pesticides
Prescribed Grazing (528A)		+++	++	Proper management of grazing and browsing animals improves plant health reducing the need for pesticides
Residue Management, No-Till (329A)		++	++	Significant reduction in adsorbed and highly soluble pesticide leaving a field
Residue Management, Mulch-Till (329B)		+++	++	Significant reduction in adsorbed and highly soluble pesticide leaving a field
Residue Management, Ridge Till (329C)		+++	++	Significant reduction in adsorbed and highly soluble pesticide leaving a field
Residue Management, Seasonal (344)		++	+	Slight to moderate reductions in adsorbed and highly soluble pesticides leaving a field
Riparian Forest Buffer (391)	+	+++	+++	Slight to significant reduction in pesticide contamination of shallow ground water and surface water

Conservation Treatment:	Pesticide Loss Pathways[1]			Comments
	Leaching	**Adsorption**	**Runoff**	
Row Arrangement (557)		++	++	Slight to moderate reduction in runoff and sediment loss.
Sediment Basin (350)		++	++	Moderate reduction of sediment and runoff
Subsurface Drainage (606)	++	++	-	Moderate reductions in pesticide movement in ground water and adsorbed pesticides on suspended sediment
Terrace (600)	-	+++	++	Moderate to significant reductions of runoff and suspended sediment carrying soluble or adsorbed pesticides
Tree and Shrub Establishment (612)	++	+++	+++	Moderate to significant reductions in pesticide usage
Waste Storage Facility (313)	+	++	++	Wastes containing pesticide residues are properly contained and not exposed to environmental element
Waste Treatment Lagoon (359)		+++	+++	Pesticides in runoff and adsorbed to suspended sediment are captured and degraded
Waste Utilization (633)	+	++	+	Increased microbial degradation of pesticide residues
Water & Sediment Ctrl. Basin (638)		++	++	Moderate reduction of sediment and runoff
Well Decommissioning (351)	+++			Closure of entry points of pesticides into ground water
Wetland Wildlife Habitat Management (644)	++	++	++	Filtering and degradation of pesticides entering wetland environments
Windbreak Establishment (380)				To control air movement avoiding physical or volatile chemical drift.

[1] Effects are rated as slight (+/-), moderate (++/--), or significant (+++/---).

[2] Additional information on management practices can be obtained from pesticide labels, NMSU pest management publications, and pest management consultants.

[3] Details regarding the effects of conservation practices on surface and ground water contamination by pesticides are contained in the Conservation Practice Physical Effects found in the National Handbook of Conservation Practices.