



Current Report

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Commercial Grape Insect and Disease Control — 2011

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PEST/PROBLEM	MATERIAL (MOA GROUP)*	RATE/ACRE	COMMENTS
Dormant Anthracnose	AllIPRo Lime Sulfur solution (M)	2 - 5 gal	The dormant application is aimed at reducing overwintering inoculum on canes if there has been a history of anthracnose in the vineyard
	Miller Lime Sulfur solution (M)	4 - 10 gal	
Bud Swell European red mite and/or scale insects (if present)	Superior oil (70-sec.)* Danitol 2.4EC (3)	4 gal 10.7-21.3 oz	Apply just before buds show green. Scout at least twice weekly as bud swell occurs.
Bud Break to Bloom Black rot- Phomopsis cane and leaf spot, Downy Mildew			Leaves and shoots are produced.
			Early sprays for these diseases are advised if they have been a problem in previous years. Repeat applications using 7 to 10 day intervals (or according to label instructions) Rotate fungicide modes of action (MOA) to prevent fungicide resistance in the pathogen populations
	Captan 50WP (M) Captan 80WDG (M)	2.0-4.0 lb 1.2-2.5 lb	Do not apply more than 12 lb of the active ingredient of Captan 50WP) or 17.5 lb of Captan 80WDG per growing season.
	Dithane DF, M-45 or WSD (M4)	1.4-4 lb	Mancozeb (Dithane, Manzate) would be the fungicide of choice, for these early stages because it is a general protectant. Do not apply these compounds within 66 days of harvest.
	Dithane F-45 (M4) Manzate 75DF, (M4) Nova 40WP (3)	1.2-3.2 qt 1.5-4.0 lb 3 -5 oz	Nova, Rally and Elite are all members of the same chemical class (triazoles).
	Elite 45DF (3) Abound 2.08F (11) Sovran 50WG (11)	4.0 oz 11-15.4 fl oz 3.2-6.4 oz	See special comments at the end regarding use of strobilurins (Abound, Sovran, Flint, Pristine).
	Flint 50WG (11)	2.0 oz	Do not apply Flint to Concord or other American type grapes as injury may occur. Flint is not recommended for downy mildew control.
Pristine (11, 7)	6-10.5 oz	Do not apply Pristine to concord or other American type grapes as injury may occur.	
Powdery mildew			On varieties that are highly susceptible to powdery mildew, a fungicide for powdery mildew control might be needed in these early sprays. Primary infections of powdery mildew can occur during this period.
	Nova 40WP (3) Rally 40WSP (3) Elite 45DF (3)	3 -5 oz 3 -5 oz 4 oz	Nova, Rally, and Elite are all members of the same chemical class (triazoles)
			Nova, Rally, and Elite are all members of the same chemical class (triazoles).
	Rubigan EC (3)	2-6 fl oz	Refer to Rubigan label for information on recommended rates.

COMMERCIAL GRAPE INSECT AND DISEASE CONTROL (CONT'D)

PEST/PROBLEM	MATERIAL (GROUP)*	RATE/ACRE	COMMENTS
Powdery mildew (cont'd)	Procure 50WS, 480SC (3) 480SC Sulfur (M4) Abound 2.08F (11) Sovran 50WG (11) Flint 50WG (11) Pristine (11, 7)) Quintec 2.08F (13) Edura 70WG (7)	4-8 oz See label 11-15.4 fl oz 3.2-6.4 oz 1.5-2.0 oz 6-10.5 oz 3-4 oz 4.5 oz	See special comments at end. See special comments at end regarding use of strobilurins (Abound, Sovran, Flint, Pristine). Do not apply Flint to Concord or other American type grapes as injury may occur. Do not apply Pristine to concord or other American type grapes as injury may occur
Ten-Inch Shoot Rose chafer	Danitol 2.4EC (3) Sevin 50WP (1A) Sevin 80S (1A)	10.7-21.3 oz 4 lb 2.5 lb	When new shoots are about 10 inches long.
European red mite (if present)	Vendex 50WP ^r (12B)	1-2.5 lb	
Apple Twig Borer	Diazinon 50WP ^r (1B)	2 lb	In southern Oklahoma, where mesquite trees are nearby, this pest may attack canes in March and April
Pre-Bloom Rose chafer Grape berry moth	Same as for 10-inch shoot spray (if needed) Altacor(28)	2.0-4.5oz	Just before bloom. Insects are often a problem in vineyards at this stage. The use of pheromone traps for grape berry moth will indicate their presence and help determine the need for control.
Bloom Black rot Phomopsis cane and leaf spot	Same as bud break to bloom		When caps begin to fall. If wet weather persists during bloom a fungicide application at mid-bloom (7 to 10 days after caps begin to fall will be necessary). See Comments at end.
Powdery mildew Botrytis bunch rot	Topsin M WSB (1) Rovral (2) Elevate 50WG (17) Scala SC (9) Vanguard 75WG (9) Sovran 50WG (11) Flint 50WG (11)	1-1.5 lb 1.5-2 lb 1 lb 18 oz 10 oz 3.2-6.4 oz 1.5-4.0 oz	While botrytis bunch rot may not be a problem every year in Oklahoma vineyards, this spray is critical in those vineyards that have a history of botrytis bunch rot. Botrytis bunch rot will typically be more severe on Vinifera and French hybrid grapes. Apply no later than 5% bloom. Rovral can be applied up to 4 times per season. Do not apply within 7 days of harvest. No more than 3 lb of elevate should be applied per season. Elevate can be applied up to, and including, the day of harvest (0-day PHI). Scala should be used at 18 fl oz. by itself, or at 9 fl oz. if tank mixed. No more than 20 oz of Vanguard may be applied per acre per season. Vanguard cannot be applied within 7 days of harvest Do not apply Flint to Concord grapes or other American type grapes or crop injury may occur.

COMMERCIAL GRAPE INSECT AND DISEASE CONTROL (CONT'D)

PEST/PROBLEM	MATERIAL (GROUP)*	RATE/ACRE	COMMENTS
Downy mildew	Ridomil Gold Copper (4) Ridomil Gold MZ (4, M4) Abound 2.08F (11) Sovran (11) Pristine (11, 7)	2 lb 2.5 lb 11-15.4 fl oz 3.2-6.4 oz 6-10.5 oz	Downy mildew is not common in Oklahoma. See comments at end regarding use of strobilurins (Abound, Sovran, and Pristine). Do not apply Pristine to concord or other American type grapes as injury may occur.
Grape phylloxera (leaf form)	Platinum(4A) Thionex 3EC (2A) Danitol 2.4EC (3) Assail WP (4A)	8.0-17oz 1.33 qt 10.7 -21.3 oz 1.1 oz	Control the root gall form of grape phylloxera by using rootstocks derived from American grapes. Native American grapes (Eastern U.S.) are nearly immune to this pest. Apply Thionex at the correct rate per acre at bloom, and repeat 10 to 14 days later. Since bees do not pollinate grapes there is no danger to bees at this time unless they are working on other blooming plants in the area being sprayed. Mow before spraying to eliminate blooms on weeds. Note: Concord, Baco Noir, Chancellor, Colobel, Cascade, and other cultivars may have severe injury if treated with Thiodan. Refer to product label. Although the product label does not list phylloxera, data indicate that Danitol also is effective against the leaf form of grape phylloxera if applied during bloom.
Shatter			When unfertilized berries fall from clusters; about 7 to 10 days after bloom or 7 to 10 days after last spray.
Black rot Downy mildew Powdery mildew	Same as bud break to bloom		See comments at end.
Grape berry moth Leafhopper Rose chafer Grape mealybug Grape rootworm Redbanded leafroller Japanese beetles	Altacor(28) BaythroidXL ^r (3) Brigade 2EC ^r (3) Guthion 2L ^r (1B) Mustang-Max ^r (3) Sevin 50WP (1A) Sevin XLR (1A) Imidan 70WP (1B) Diazinon 50 WP ^r (1B) Diazinon AG500 ^r (1B) Platinum(23) Provado Solupak 75WP (4A) Danitol 2.4EC (3)	2.0-4.5 oz 2.4-3.2 oz 3.2-6.4 oz 3-4 pt 4 oz 4 lb 2 qt 1.33-2.13 lb 1-2 lb 1-2 pt 8-17.0 oz 0.75-1.0 oz 5.3-10.7 fl oz	Leafhoppers and leafrollers only. For leafhopper control only. It is important to monitor for all insect pests after petal-fall. Pheromone traps offer help in determining the presence of redbanded leafroller and grape berry moth. Berry moth emergence begins late May and June; there may be three generations per year. Guthion may be mixed with Sevin or Methoxychlor for better control of berry moth. Examining the underside of grape leaves will indicate if leafhoppers are present. Check insecticide labels for more information on specific insects. A maximum of 2.0 oz of Provado may be applied per acre per season. Provado is labeled for use against leafhoppers and mealybugs. Danitol is labeled for use against leafhoppers, grape berry moth, Japanese beetles, and redbanded leafroller. Higher rates (up to 21.3 oz/A) may be used to control the latter three pests.

COMMERCIAL GRAPE INSECT AND DISEASE CONTROL (CONT'D)

PEST/PROBLEM	MATERIAL (GROUP)*	RATE/ACRE	COMMENTS
	Ecozin 3EC (18)	8.0-10.0 oz	
	Spintor 2 SC (5) Intrepid 2F (18)	4-8 oz 4-8 oz	Spintor and Intrepid are also for caterpillar pests only. Ineffective against beetles.
Mites	Brigade 2EC ^r (3) Vendex 50WP ^r (12B) Fujimite 5EC (21) Onager 1EC (10A) Nexter 75WP (21) Acramite 50WS (25) Agri-Mek 0.15EC (6) Danitol 2.4EC (3) Zeal (10B)	6.4 oz 1-2.5 lb 2 pt. 12-24 oz 4.4-13.2 oz (1-3 bags) 0.75-1.0 lb 8.0-10.0 oz 10.7-21.3 oz 2.0-3.0 oz	One application per year. Plus a nonionic surfactant. One application per season.
First Cover to Veraison (Berry coloring)			First cover should follow shatter by 10 to 14 days. Refer to label for application timing and harvest restrictions.
Black rot Powdery mildew Downy mildew	Same as bud break to bloom		Sprays for black rot control may be stopped after berries turn color (reach 6-8% sugar). See other comments at end.
Mites	Same as shatter sprays		
Grape berry moth Rose chafer Leafhopper Redbanded leafroller Grape rootworm Grape mealybug	Brigade 2EC ^r (3) Dimethoate 4EC (1B) Guthion 50WP ^r (1B) Sevin 50WP (1A) Sevin 80S (1A) Imidan 70WP (1B) Diazinon 50WP ^r (1B) Intrepid 2F (18) Diazinon AG500 ^r (1B) Danitol 2.4EC ^r (3) Provado Solupak 75WP (4A)	3.2-6.4 oz 0.5-1.0 pt 1.5-2 lb 4 lb 2.5 lb 1.33-2.13 lb 2 lb 4-8 oz 1-2 pt 5.3-10.7 fl oz 0.75-1 oz	For leafhoppers only. See comment on insect control at shatter. Do not use Guthion more than three times in one season. Do not use Sevin with copper-lime. See notes under shatter section. Danitol is labeled for use against leafhoppers, grape berry moths, mites and Japanese beetle. A maximum of 2.0 oz of Provado may be applied per acre per season. Provado is labeled for use against leafhoppers and mealybugs.
Veraison to Harvest			Refer to label directions for timing of applications and harvest restrictions.
Black rot			As berries reach full size and sugar content starts to increase, they become resistant to infection by the black rot fungus. In general, berries are no longer susceptible to black rot after veraison (6-8% sugar content).
Botrytis bunch rot	Same as bloom.		This spray is critical in vineyards or on varieties where Botrytis bunch rot has been a problem. See comments on Botrytis bunch rot at end of this section.
Grape berry moth Grape leafhopper Japanese beetle Green June beetle Rose chafer Grape root borer	Same as first cover to veraison See recommendations at end of section.		Continue to monitor for insect and mite pests, and apply insecticide as needed. Refer to product label for specific insects, rates, and harvest restrictions.

COMMERCIAL GRAPE INSECT AND DISEASE CONTROL (CONT'D)

PEST/PROBLEM	MATERIAL (GROUP)*	RATE/ACRE	COMMENTS
Mites	Same post bloom to veraison		
† Restricted use Pesticide. *Chemical Group Classifications can be found at the following Web sites: Herbicides- http://www.plantprotection.org/hrac/ , Insecticides- http://www.irac-online.org/ , Fungicides- http://www.frac.info/ .			
RESIDUE REMINDER:	VISIBLE FILMS OF SPRAY RESIDUE ARE UNATTRACTIVE ON		FRESH FRUIT AND DIFFICULT TO REMOVE.
POST HARVEST			
Powdery mildew	Same as earlier sprays. Check label for specifics.		Post-harvest leaf damage predisposes vines to winter injury and reduces fruit set in the following season.

*Horticultural oils are physical toxicants which act as suffocant and entrapment insecticides.

GRAPE ROOT BORER

It is generally difficult to evaluate damage from the grape root borer. Injury is most often associated with a slow decline of vineyards, when it can be associated at all. If grape root borer is not a problem, there is no reason to risk destroying the natural control processes (predators, parasites, diseases). Treat with an insecticide only if necessary. If you believe that this insect is affecting your vineyard's performance, you may wish to begin the following program. Sampling is critical for several reasons: 1) The control program is relatively expensive; and 2) Use of an insecticide can create as well as solve problems.

Immediately After Harvest

Sample - 10 vines/acre (but not less than 50 vines).

Examine - A circular site (3 ft in diameter) around the base of each plant, concentrating on the inner 1 ft, looking for shed pupal skins of the grape root borer moth. If pupal skins are found beneath 5% of the vines examined, apply an insecticide next year.

35 Days Before Harvest

If previous year's sample indicates a need to spray, apply Lorsban 4E, following label instructions. Older vines are more likely to be infested. Apply an insecticide as late as the label permits, but before harvest.

GREEN JUNE BEETLE, JAPANESE BEETLE AND ROSE CHAFERS

As the crop reaches maturity, these beetle pests may become more of a problem, particularly feeding on ripened fruit. When soil conditions are moist before or slightly after veraison, and organic matter in surrounding area is high then these beetles can be quite common and difficult to control. Careful attention to beetle infestation 1 month prior to harvest should be given to keep populations in check. Use of Danitol up to 21 days before harvest can decrease populations. Rotation to Sevin insecticide up to 7 days before harvest will further aid in control.

GRAPE BERRY MOTH - Mating Disruption Strategy

A new use of pheromones is for insect control using the strategy of mating disruption; this expands the use of sex-attractant pheromones beyond their traditional role in insect monitoring.

The pheromone is imbedded in 8-inch long plastic twist-ties. The atmosphere of the vineyard is saturated with the scent of the pheromone by attaching twist-ties to vines, with 400 twist-ties per acre. The pheromone confuses the male moths so that they are unable to locate and mate with females. Females are unaffected by the pheromone and can lay unfertilized eggs, but these eggs are unable to develop. This strategy should be considered only for vineyards that are at least 5 acres in size.

For grape berry moth, the product is called Isomate-GBM, manufactured by Shinetsu Chemical Company and distributed by Pacific Biocontrol of Davis, California. It is distributed in the Midwest by Great Lakes IPM, Vestaburg, Michigan (phone 517-268-5693).

GRASSHOPPERS

Grasshopper control can be and should be concentrated very early in the season before populations migrate into vineyard borders. Young, unwinged nymphs may cause severe defoliation of border plants and progress into vineyards if left unchecked. If treatment is directed outside the vineyard, in pasture areas then applications of Dimilin early in the season can prevent buildup of populations. When controlling grasshoppers inside the vineyard, then careful use of labeled compounds is the only recourse. Some level of effective control has been obtained using NOLO® Bait, a biological control agent containing tiny protozoan spores. This product is slow acting and does not store well, so use it early and often enough to be effective and to deplete your supply.

BOTRYTIS BUNCH ROT

Use Rovral 50 WP at the rate of 1.5 to 2 lb per acre, Vanguard 75WG at 10 oz/A, or Elevate 50 WG at 1 lb/A. Botrytis bunch rot is most commonly a problem on tight-clustered French hybrid and Vitis vinifera cultivars. Proper timing and thorough spray coverage are essential for good control. Direct the spray toward the fruit, and use a minimum of 100 gal/A of water. Include a spreader-sticker with Rovral, especially at the 1.5 lb rate. NOTE: Removal of leaves around clusters on mid- or low-wire cordon-trained vines before bunch closing has been shown to reduce losses caused by Botrytis.

SULFUR

There are many formulations of sulfur labeled for use on grapes. Sulfur is available in dry flowable (DF) and flowable (F) formulations, as well as wettable powder (WP) and dusts (D). The dry flowable and flowable formulations greatly reduce the applicator's exposure as compared to wettable powders and dusts. Use rates are different for different formulations. See the label for specific use rates. Some grape varieties, such as Concord and other Labrusca (American) types, are extremely sensitive to sulfur. Do not apply when temperature during or immediately following application will exceed 85°F. Sulfur loses efficacy for powdery mildew control at temperatures below 65°F.

STROBILURINS

ABOUND FLOWABLE

Abound is in the same general class of chemistry as Sovran, Flint, and Pristine (strobilurin) and is registered for control of black rot, downy mildew, powdery mildew, and Phomopsis cane and leaf spot. Abound is excellent for control of black rot and

downy mildew, and provides good control of powdery mildew. Abound is recommended at the rate of 11 to 15.4 fl oz per acre. In University tests, the rate of 11 to 12 fl oz provided good control of the above mentioned diseases.

NOTE: Abound Flowable is very phytotoxic to apples of the variety McIntosh or varieties related to McIntosh. Do not use the same sprayer to apply Abound to grapes that will be used to apply other materials to apples. Do not allow spray to drift from grapes to apples.

SOVRAN 50 WG

Sovran 50 WG is in the same general class of chemistry as Abound Flint, and Pristine (strobilurin). It is registered for control of black rot, powdery mildew, Phomopsis cane and leaf spot, and downy mildew. The Sovran label gives different use rates for control of different diseases. For black rot and Phomopsis cane and leaf spot the rate is 3.2 to 4.8 oz/A; for powdery mildew the rate is 3.2 to 4.8 oz/A and for downy mildew the rate is 4.0 to 6.4 oz/A. Sovran is excellent for control of black rot and powdery mildew, but is less effective than Abound for downy mildew control. Under heavy disease pressure, Sovran may not provide adequate control of downy mildew even at the higher rate. Unlike Abound, Sovran is not phytotoxic on certain apple varieties. Sovran has a 14 day PHI. See label for further information and certain use restrictions.

FLINT 50 WG

Flint 50 WG is in the same general class of chemistry as Abound, Sovran, and Pristine (strobilurin). It is registered for control of black rot, powdery mildew and downy mildew. The Flint label provides different use rates for control of different diseases. For powdery mildew the rate is 1.5 to 2.0 oz/A; for black rot the rate is 2.0 oz/A and for downy mildew the rate is 4.0 oz/A. Flint is excellent for control of black rot and powdery mildew, but is not highly effective against downy mildew, and is not recommended for control of downy mildew. Unlike Abound, Flint is not phytotoxic to certain apple varieties; however, Flint is very phytotoxic to Concord grapes. The label states "Do not apply Flint to Concord grapes or crop injury may occur." See label for further information and certain use restrictions.

Pristine 38 WDG

Pristine 38WDG contains a combination of two active ingredients (pyraclostrobin, 12.8% and boscalid 25.2%). Pyraclostrobin is in the same general class of chemistry as Abound, Sovran, and Flint (strobilurin). Boscalid is a new class of chemistry with excellent activity against powdery mildew and good activity against Botrytis. With increasing resistance in powdery mildew to the sterol inhibiting fungicides (Nova, Rubigan, Procure, Elite) and the strobilurin fungicides (Abound, Sovran, and Flint), the addition of a new powdery mildew fungicide (boscalid) is timely. Pristine will probably be an important component in our resistance management programs for powdery mildew. Pristine is registered for control of anthracnose, black rot, downy mildew, powdery mildew, and Phomopsis cane and leaf spot, and "suppression only" of Botrytis gray mold. Pristine is registered for use at the rates of 6-10.5 oz per acre. A maximum of 6 applications may be made per season. Pristine has a 14-day preharvest interval and 24-hour re-entry interval. The label also states "Do not use on Concord, Worden, Fredonia, or related varieties due to possible foliar injury."

RESISTANCE MANAGEMENT FOR STROBILURIN FUNGICIDES

Do not apply more than 3 sequential sprays of Abound, Sovran, Flint, or Pristine before alternating with a fungicide that has a different mode of action. For wine and table grapes, do not make more than 4 applications of a strobilurin fungicide per acre per year. For all other types of grapes, do not make more than 3 applications of a strobilurin fungicide per acre per year. Always read the label.

IMPORTANT NOTE ON POWDERY MILDEW:

In some locations, the powdery mildew fungus has developed resistance to the sterolinhibiting fungicides (Nova, Rubigan, Elite, and Procure) and the strobilurin fungicides (Abound, Sovran, and Flint). All of these materials were highly effective for control of powdery mildew when they were first introduced. In the vineyards where these materials have been used for several years, reduced sensitivity or resistance may be present. For this reason, it is recommended that these materials not be used alone when powdery mildew needs to be controlled. In order to provide adequate control of powdery mildew, they should be mixed with sulfur, JMS Stylet Oil, Quintec, Endura, or potassium salts. Pristine is a combination of a strobilurin fungicide plus Endura; therefore it can be used alone. Sulfur is an inexpensive and very effective fungicide for powdery mildew control. On sulfur tolerant varieties, the use of sulfur should be considered.

ADDITIONAL PESTICIDE INFORMATION

Insecticides	REI	PHI	Signal Word
Acramite	12 hrs	14 days	Caution
Agri-Mek	12 hrs	28 days	Warning
Assail	12 hours	7 days	Caution
Brigade 2EC ^r	12 hrs	30 days	Warning
Danitol	24 hrs	21 days	Warning
Deliver	4 hrs	0 days	Caution
Diazinon ^r	24 hrs	28 days	Caution
Dimethoate 4EC	4 days	28 days	Warning
Ecozin	12 hrs	0 days	Warning
Fujimite	12 hours	14 days	Warning
Guthion ^r	21 days	21 days	Danger
Imidan	24 hrs	14 days	Warning
Intrepid 2F	4 hrs	30 days	Caution
Mustang-Max ^r	12 hrs	1 day	Warning
Nexter	12 hours	7 days	Warning
Onager	12 hrs	28 days	Caution
Provado	12 hrs	0 days	Caution
Sevin 4F	12 hrs	7 days	Caution
Spintor 2SC	4 hrs	7 days	Caution
Thionex	24 hrs	7 days	Danger
Vendex ^r	48 hrs	28 days	Danger
Zeal	12 hrs	14 days	Caution

Fungicides	REI	PHI	Signal Word
Abound	4 hours	14 days	Caution
Captan 50WP 80WDG	72 hours	0 days	Warning
Elevate 50WG	4 hours	0 days	Caution
Elite 45DF	12 hours	14 days	Warning
Endura	12 hours	14 days	Warning
Flint 50WG	12 hours	14 days	Caution
Lime Sulfur	48 hours	0 days	Danger
Mancozeb, Dithane, Manzate	24 hours	66 days	Caution
Nova 40W	24 hours	14 days	Warning
Pristine	24 hours	14 days	Caution
Procure 50WS	12 hours	7 days	Caution
Quintec	12 hours	14 days	Caution
Rally 40WSP	24 hours	14 days	Warning
Ridomil Gold Copper	48 hours	66 days	Danger
Ridomil Gold MZ	48 hours	42 days	Caution
Rovral 4F	48 hours	7 days	Caution
Rubigan 1EC	12 hours	30 days	Warning
Scala SC	24 hours	7 days	Caution
Sovran 50WG	12 hours	14 days	Caution
Sulfur	24 hours	14 days	Caution
Topsin M WSB	7 days	14 days	Caution
Vanguard WG	12 hours	7 days	Caution

The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
 - It is administered by the land-grant university as designated by the state legislature through an Extension director.
 - Extension programs are nonpolitical, objective, and research-based information.
 - It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
 - More than a million volunteers help multiply the impact of the Extension professional staff.
 - It dispenses no funds to the public.
 - It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
 - Local programs are developed and carried out in full recognition of national problems and goals.
 - The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
 - Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

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