



# Desiccants for grapevines

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French Columbard vines defoliated by ammonium nitrate spray (left) compared with untreated vines.

Growers occasionally wish to prune grapevines before the leaves have shed naturally. This is most likely to happen in the Coachella Valley of southern California where frost does not kill the leaves.

Pruning with leaves on the vines increases pruning costs, especially on cane-pruned vines such as Thompson Seedless. Some method of defoliating the vines would lower pruning costs. Many materials, including those used on cotton, might well be effective on grapevines, as noted from accidental applications where vines border that crop. None is ever likely to be registered for such a purpose, however, because the need is such a limited one.

Growers have reported success in removing leaves with ammonium nitrate sprays and some other salt solutions. Following those reports, several materials were tested on vines at the Kearney Agricultural Center in late October and November in 1981. In the first trials, the materials were applied as dilute sprays on Thompson Seedless at about 200 gallons per acre. The materials and dosages per 100 gallons of water were: 1) Ammonium nitrate at 50, 60 and 80 pounds, 2) Ammonium sulfate at 40, 60, 80 and 100 pounds, 3) Calcium chloride (94-97 percent) at 20, 40, 60 and 80 pounds, 4) Sodium chloride at 10, 20, 30, 40, 50 and 60 pounds, and 5) Zinc sulfate (36 percent) at 10, 20, 30 and 40 pounds. A partial summary of the results is given in the table.

Of the materials tested, ammonium nitrate was clearly the most effective defoliant, at a rate of application of 160 pounds per acre. Zinc sulfate was the poorest with the heaviest dosage producing only spotting of a few leaves.

Following this preliminary trial, further studies were done with ammonium nitrate. A 20 percent ammonium nitrate solution (equivalent to 6.3 pounds ammonium nitrate per gallon of water) was sprayed on Thompson Seedless at rates

of 15 to 30 gallons per acre, undiluted in a concentrate sprayer. After a week, 95 percent or more of the leaves were desiccated on vines treated at rates of 25 or 30 gallons per acre. Later, 27 gallons of the 20 percent ammonium nitrate solution were applied undiluted in a concentrate sprayer to Thompson Seedless, Emperor, Ribier, Grenache and Rubired. Ninety to 100 percent of the leaves were killed within 10 days. In 1983, 25 gallons of the 20 percent ammonium nitrate solution were applied per acre to French Colombard, Chenin Blanc and Barbera vines. The leaves were 90 percent or more desiccated after a week.

We concluded that the leaves on grapevines could be desiccated in the fall with treatment of 25 gallons of 20 percent ammonium nitrate solution or 160 pounds of dry ammonium nitrate, (33.5 percent nitrogen) per acre. The materials may be applied either as concentrate sprays or as dilute sprays up to 200 gallons per acre. Precise comparisons of gallonage per acre were not made but it appears that the lower the gallonage the better, providing good coverage is obtained.

Leaves are killed more rapidly and slightly more effectively with underleaf

coverage than with upperleaf coverage. The rapidity and effectiveness of leaf desiccation is also dependent upon temperature. At temperatures of 80°F and above, most of the desiccation had occurred in three days. At lower temperatures, a week or more was required for maximum desiccation and results were not quite as good. Desiccation also varied slightly with the variety of grape, and the condition and number of leaves. Lush green leaves desiccated more easily than senescent ones.

Ammonium nitrate is classified as a desiccant-defoliant. On grapevines, it acts more as a desiccant, killing the leaves, than as a defoliant which promotes leaf fall. After spraying, visibility is improved satisfactorily on spur-pruned vines even though not many leaves may have fallen off. However, on cane-pruned vines, such as Thompson Seedless, a wind or rain is usually required after the spray to improve visibility sufficiently for easy pruning. If necessary, leaves could be blown off with the fans from an air carrier sprayer if winds have been inadequate.

The amount of nitrogen applied per acre from the ammonium nitrate spray is about 50 pounds per acre. About half of this is in the nitrate form and becomes available to plants as a source of nitrogen fertilizer. The other half is in the form of ammonia, some of which can be lost by volatilization, especially in calcareous soils that contain free lime and have a pH over 7. All of the nitrogen applied in this program will be subject to leaching losses from winter rains.

This information is presented as a record of experimental results. Ammonium nitrate is not registered for use as a desiccant/defoliant for grapevines.

Desiccation produced by various salts seven days after application at a rate of 200 gallons per acre		
Material	Pounds per 100 gal water	Percent desiccated leaves
Ammonium nitrate	40	40
	60	50
	80	85
Ammonium sulfate	100	50
Calcium chloride	40	35
	60	40
	80	50
Sodium chloride	40	38
	60	60
Zinc sulfate, 36%	40	none, 10-15% spotted leaves

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