

PRE-PLANT VINEYARD FUMIGATION TECHNIQUES AND COSTS

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AGRICULTURE

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This sample cost analysis pertains to fumigating vineyards infested with Xiphinema index (the Dagger nematode) and secondly to the fanleaf, yellow mosaic, veinbanding virus-disease complex in grapevines in the Livermore and Santa Clara Valleys. This information should be useful in determining costs and can be used as a procedure guide.

Necessary Chemicals

Soil fumigants containing 1, 3-dichloropropene as the principal active ingredient are the most widely accepted for pre-plant use. These include DD, Telone, and Vidden-D. Experience in Alameda and Santa Clara Counties has been with DD. Other materials are used where Oak Root fungus (Armillaria mellea) is a problem.

High Rates of Chemicals

High rates of chemicals, which means 250 gallons per acre of DD or Telone, are necessary to combat the presence of both the Dagger nematodes and the virus in the old roots. Reinfestation of nematodes and virus has occurred within two years after treatment when lower rates were used. High rates of the chemical are used to reduce to one year the time between vine pull-out and the planting of new vines.

Preparation of Ground

Old vines are normally pulled during the winter and the vineyard cleaned of all roots and other debris. In the spring the ground should be thoroughly worked when soil clods can be easily broken apart. Experience indicates that thorough soil preparation prior to fumigation is very important for adequate penetration of the chemical. (The soil should be pulverized to a depth of 30 to 36 inches.) A light irrigation should be applied if the soil surface is dry.

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	Hours Per Acre	Labor \$	Fuels & Repairs \$		Total \$/A
<u>CULTURAL COSTS</u>					
Pull vine				Contract	15.00
Clean up and burn	6.0	12.00	1.20		13.20
Subsoil 3x @ 36"	5.0			Contract	63.50
				(80 h.p. tractor @ \$11/hr and ripper @ \$1.70/hr)	63.50
Disk and roll 2x	1.0	3.00	2.40		5.40
One 1" irrigation	3.2	6.40		power to pump	2.65
Disk and roll 2x	1.0	3.00	2.40		5.40
Fumigant application @ 30" and 8"	4.5			Contract	57.15
				(80 h.p. tractor and ripper @ 12.70/hr)	57.15
Fumigant				DD or Telone @ 200 gal @ 30" plus 50 gal @ 8" @ \$1.55/gal (application equipment included)	387.00
Chisel	.8	2.40	1.40		3.80
Misc.; phone, pickup, etc.					1.55
TOTAL CASH COST	21.5	26.80	7.40		526.85
<u>OVERHEAD COSTS (Depreciation and Interest)</u>					
40 h.p. tractor	2.8 hrs at \$2.00 per hour				5.60
Equipment	2.8 hrs at \$2.50 per hour				7.00
Moving time of 80 h.p. tractor				\$70. (per 10 Acres = \$7/A)	7.00
TOTAL OVERHEAD COSTS					19.60
GRAND TOTAL					580.65

Skilled labor \$3.00 per hour
Common labor \$2.00 per hour
40 h.p. crawler tractor \$2.00 per hour (15 year life; 500 annual hours)
Truck \$2.00 per hour
Other equipment \$2.50 per hour (10 year life; 200 annual hours)

Mid-Summer Application

Soil temperatures at the time of treatment should test 50° to 85° F. at a six-inch depth. To facilitate the penetration of the fumigant, the soil should be moist but not saturated. Usually the fumigant applications should be made in July. Preparation of the soil at this time allows a long aeration period between fumigation and replanting the following spring.

Application Techniques

A split application of the fumigant is necessary:

- .. 200 gallons at a depth of 30 to 36 inches with the chisels 18 inches apart.
- .. 50 gallons at a depth of 8 to 10 inches with the chisels 12 inches apart.

The soil should be sealed immediately with a culti-packer or similar equipment after applying the fumigant.

Both applications can be made at the same time. However the deep application can be made separately from the shallow one, providing the soil is sealed after each application. If the shallow treatment is applied separately, it should be made at right angles to the deep one.

Aeration Time

The soil should be left undisturbed until October or November when it may be aerated by chiseling. An interval of at least one week between treatment and planting is recommended in light soils for every 10 gallons of fumigant. Heavier soils require longer waiting periods before planting. Longer waiting intervals may also be required if soil temperatures drop significantly or if rains saturate the soil following treatment.

Planting Time

Grapevines may be planted after all odor of the chemical has disappeared which should be near the normal planting time in the winter following treatment. If there is doubt about complete absence of chemical odor, the holes for planting might be dug and left open several days before planting the new vines.

Certified Stock

For new plantings only certified stock, free from known virus diseases should be used.

Consult the farm advisor for sources of certified planting stock. Nematodes and Their Control in Vineyards, U. C. Agricultural Circular 533, is a useful reference for a background of information.

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