

FERTILIZER VALUE OF GRAPE POMACE*

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Grape pomace is the grape seeds and skins left over from winery operations. Farmers have been using pomace as a fertilizer for years. The big question is what is its fertilizer value?

Each ton of grapes crushed at the winery produces 20 to 100 pounds of stems and 160 to 240 pounds of semi-solid pomace. These values vary as to variety.

Chemical Composition

Stems - The stems make up from 1 to 5 per cent of the grape cluster. They average about 25 per cent dry matter, 0.9 per cent nitrogen, 1.2 per cent potash, and 0.1 per cent phosphoric acid on a dry weight basis.

Grapes are usually stemmed before crushing and do not become part of the pomace. Most stems are dried and burned. The problem of handling/spreading the stem makes their value as a fertilizer questionable.

Skins - The skins constitute from 6 to 10 per cent of the grape berry, and before fermentation contain about 30 per cent dry matter, 0.3 per cent nitrogen, 0.6 per cent potash, and 0.1 per cent phosphoric acid.

Seeds - The seed content varies from almost nothing in seedless varieties to nearly 5 per cent in Pinot Noir. About 70 per cent of the seed is dry matter, 1.0 per cent nitrogen, 0.6 per cent potash, and 0.5 per cent phosphoric acid.

Pomace - In usual winery practices the skins and seeds go into at least a part of the fermentation, and after separation from the juice or wine the fermentation is often completed with the addition of water in order to recover as much wine as possible in subsequent pressings. The residue from the pressing process is pomace. The pomace as it comes from the press contains 30 to 70 per cent water, depending on fermentation and dryness of pressing, averaging about 50 per cent. The nitrogen content of wet pomace ranges from 0.6 per cent to 1.3 per cent and averages roughly 0.9 per cent; potash content varies from 0.5 to 1.5 per cent, averaging 1.0 per cent; and the phosphorus content averages about 0.25 per cent.

Calculating Fertilizer Values of Wet Pomace

To determine the fertilizer value of a ton of pomace, you must know the following:

- Pounds of nutrient per ton of pomace
- Price per pound of nutrients in commercial fertilizers

* Information developed by H. E. Jacobs, Viticulturist, University of California, Davis

Average Nutrient Content in a Ton of Wet Pomace

Nitrogen (N)	.90% = 18 lbs/ton
Potash (K ₂ O)	1.00% = 20 lbs/ton
Phosphorus (P ₂ O ₅)	.25% = 5 lbs/ton

Bulk Prices of Fertilizers (Oct. 1978)

<u>Material</u>	<u>Price/Ton</u>	<u>Per Cent Fertilizer Analysis</u>	<u>Cents/Lb of Nutrient</u>
Ammonium Sulphate	\$ 92	21.0	21.9 (N)
Ammonium Nitrate	\$156	33.5	23.3 (N)
Sulphate of Potash	\$162	52.0	15.6 (K)
Triple Super Phosphate	\$175	45.0	19.4 (P)

(Example of Calculation: 18 lbs. N x 22 cents/lb = \$3.96 value of nutrients in a ton of wet pomace.)

NOTE: Since the fresh pomace contains on the average about 50% water, completely dry pomace may have double these values. On the other hand, if the pomace has "burned" in the pile or has been leached by rains, much of the N will be lost.

For vineyard use, any fertilizer should be evaluated only on the basis of its nitrogen content because vines in California seldom show a direct, economically favorable response to moderate applications of potash or phosphorus. You must consider the costs of hauling and spreading pomace when comparing it with the costs of commercial fertilizers applied. Some of the possible benefits from the pomace that may warrant a slightly higher cost are the addition of organic matter to improve soil structure and perhaps some indirect value of potash and phosphorus on the growth of cover crops. In any case, the value of pomace for vineyards may be somewhere around \$4 per ton applied. For shallow rooted crops the full value of nitrogen, potash, and phosphorus may be realized and the pomace may have a value of \$8.18 per ton.

For fertilizer, the composition of winery pomace indicated that it has about the same value as ordinary cow manure. The nitrogen, phosphorus, and potash in manure are more readily available and a quicker response is obtained from manure than from pomace. The pomace will provide a slow release of nutrients and thus a more lasting effect. The seeds require two or more years to decompose. The slow decomposition and low salt content allow for larger applications of pomace in comparison with animal manures.

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