

Long Island Sustainable Winegrowers Nitrogen Management Program

The purpose of delineating a nitrogen management program for Long Island Sustainable Winegrowers' vineyards is to insure that we supply the nitrogen needed for healthy vines and commercial yields, while protecting our ground water from excess nitrate-nitrogen through leaching.

All forms of soil nitrogen, whether from soil organic matter, added compost or synthetic nitrogen fertilizers will eventually release nitrate-nitrogen in an aerobic soil environment. Nitrate-nitrogen is potentially highly leachable in soils which are naturally well-drained, as ours are here on the eastern end of Long Island. If excessive levels of nitrate-nitrogen exist in the soil water, significant rainfall can cause excess nitrate leaching to our ground water.

According to experts, background levels of natural nitrate-nitrogen entering ground water under fallow land on Long Island ranges from 1-2 mg/l and is necessary for the health of our estuaries and bays. Their work shows that Long Island vineyard test wells measure an average ground water level of 4.3 mg/l nitrates, which is below the emerging national target level of 5-6 mg/l. Nitrate levels higher than 10 mg/l (designated the Maximum Contaminant Level by the US EPA and NYS) have been found in some ground water in New York State.

This is why the timing of a nitrogen application, the amount of nitrogen in an application and the form of nitrogen are all important factors to consider when designing a fertilization program to meet a vineyard's needs.

Fortunately, *Vitis vinifera* grapevines do not require large amounts nitrogen to grow to full size and produce an economically viable crop each year. It is estimated that each ton of fruit picked from an acre of vines removes only 4 lbs of actual nitrogen. Nitrogen is re-mobilized within a vine as the leaf tissue fades in the late summer and fall. In addition, leaves fall to the ground and vine prunings are commonly chopped in the row middles and return their stored nitrogen back to the vineyard soil.

The Vine Balance workbook (Page 42) limits total actual nitrogen application to less than 20 lbs per acre in order to score a "2" which is the highest score allowed for most of the 18 Core Criteria, of which this is one. In addition (Page 43) of the Core Criteria requires that at least some of the nitrogen supplied to a LISW certified sustainable vineyard be from some form of organic material (see list below).

Neglected blocks that require renovation and those vineyards that use under vine mowing are examples of situations that might warrant >20 lbs./a of nitrogen fertilizer to correct a deficiency. Up to 40 lbs./a actual N is allowed in these situations with grower justification. Justification includes at least one, preferably two or more of the following: photographs of stunted vines; field visit by extension agent or LISW certifier; yield records indicating insufficient yields; records of decreasing vine pruning weights; tissue analyses that indicate a deficiency. Score these situations a '2' in the VineBalance workbook.

Nitrogen applied too late in the Fall (after leaves stop functioning well) and too early in the Spring (prior to budbreak) is more subject to leaching because of lack of vine uptake of nitrate nitrogen by inactively metabolizing vines. The Core Criteria from the VineBalance Workbook encourages split applications of nitrogen during the period of highest nitrogen use (budbreak to fruit set) to keep the soil concentration of available nitrogen lower than a single larger application.

Organic sources of nitrogen such as mature compost, organic materials (blood or feather or peanut meal) or slow-release formulations of synthetic nitrogen are less subject to leaching than ammonium nitrate, because their nitrogen is transformed into the nitrate form more slowly, allowing the crops to assimilate the nitrogen over time, rather than all the readily available nitrogen being subject to leaching from one large rainstorm.

The application of nitrogen to a vineyard should be based on not just the simple limitation of 20 lbs per acre in the Workbook, but on an integrated understanding of how vines in each vineyard block are growing and producing as years go by (Page 41). Maintaining adequate vine size, as measured by pruning weights, economic yields, canopy fill, vine vigor and lack of obvious nitrogen deficiency are all essential factors to track in order to understand whether a grower is meeting his vine's nitrogen needs or over-fertilizing.

Listed below are forms of nitrogen that are considered "organically" acceptable. Some of these formulations may not be OMRI product-listed or allowed by the NOSB, but fall well within the standards of the Long Island Sustainable Winegrowers program. They include:

Blood Meal	Mulch from mowing
Compost*	Mulch from prunings
Compost tea*	Peanut Meal
Feather Meal	Seaweed, various formulations
Fish Fertilizer, various liquid	Soy-based material

*Compost—for the proper preparation of compost and its appropriate use in a soil fertility program please refer to section titled "Compost".