PROCEEDINGS OF THE

22nd ANNUAL
HORTICULTURE INDUSTRIES SHOW

HOLIDAY INN
NORTHWEST ARKANSAS CONVENTION CENTER

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Profiting Through Innovation
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Selecting an Appropriate Trellis/Training System Based on Specific Variety Characteristics.

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Introduction:

It is a fundamental tenant of our view of grapevine culture that for any given genotype-environment interaction there is a “best” way to grow a cultivar in order to achieve maximum sustainable yields of ripe grapes. Tools we have to achieve that “best” goal are: 1) choice of a trellis and vine training system that allows an optimal distribution of leaf area to sunlight; 2) an understanding of the leaf area : crop load relationship; and 3) a precise and accurate method of crop control so that the growth:yield relationship is in balance. Over three decades we have spent considerable time on numerous grape varieties, including juice grapes, and both resistant hybrid and grafted vinifera wine grapes in Michigan. In the course of those efforts we have developed an understanding of principles of vine growth and productivity. We are gratified to note that these principles are applicable whether one is referring to Concord or Niagara, Chambourcin or Vidal blanc, Riesling or Cabernet Franc in Michigan, Chardonnay or Pinot noir in Switzerland or Sauvignon blanc or Pinot gris in New Zealand.

Leaf Area, Crop Load and Training System

Let us begin with principles of vine physiology which will influence trellis choice. At optimum leaf area and crop load, a vine’s carbohydrate (CH₂O) status will change considerably over the growing season. The data presented here are drawn from a number of studies, and those interested are encouraged to read those articles. These data are presented as a means to illustrate key points from these studies (1-5, 7-10, 12, 14-20).

Using optimally cropped, potted vines so that we can easily make destructive analysis of all vine organ systems, we note that the preponderance of CH₂O is in the roots at fruit set (Table 1). Obviously, not all dry weight is mobile CH₂O, but Edson’s (2-5) work showed a 30% reduction in root dry weight in the period from planting to bud burst. Similarly cropped vines, when compared from fruit set to harvest, showed a decline in root % dry weight of 54.4 to 32.7, respectively. Importantly, however, one also notes a nearly 6-times greater total vine weight. That means root dry weight at harvest is about double that at fruit set (Table 1).

An assessment of crop load on different vine organ performance as measured at harvest is also interesting (Table 2). The most striking result is this; even though a range of 0-43% of the vine’s dry weight was as fruit, it did not influence the total amount of dry weight accumulated by the vine. Said another way, under a given set of environmental conditions there is a maximum amount of carbon that can be fixed by photosynthesis and distributed throughout the vine. Vine management, including choice of training system, influences how that CH₂O is allocated, but can do little to influence total CO₂ assimilation once the system has reached optimum. Again, this amplifies our concern about crop control in cool climates. Heavily (over) cropped vines in benign climates with long periods of post-harvest leaf area can recover and replenish CH₂O reserves mobilized during fruit ripening. Cool climate regions, with vines, losing leaves at or near harvest, lack such a recovery capacity, and superior viticulture and an effective marrying of cultivar, site, rootstock and training system is required if yield and quality are to be sustained at optimum levels over years.

Training Systems and Vine Growth Habit

Foremost among the issues associated with the selection of a training system is its compatibility with the vine’s growth habit. Vitis labruscana cultivars such as Concord, Catawba or Niagara have a recumbent or weeping growth habit. Such cultivars commonly have longer internodes and larger leaves, and this creates the “hanging” habit of growth. By contrast, V. vinifera cultivars such as Riesling, Pinot noir, Chardonnay or Cabernet Sauvignon commonly have upright, vertically growing shoots with relatively short internodes and
smaller leaves. For the resistant, interspecific hybrids one can find cultivars of both “upright” and “hanging” extremes and examples along a continuum between these.

Generally speaking, we select systems which produce the crop at or near the top wire (5.5 - 6.0 ft) for recumbent types, and at or near the mid-wire (28-36") for the upright types.

**Training Systems and Vine Fruiting Habit**

A second consideration will be the fruiting habit of the cultivar in question. This will determine whether long-cane pruning is required or spur-pruned systems are possible. For some cultivars the basal count nodes one and two are low in fruitfulness. Retaining enough of these to produce a balanced crop can lead to excess shoot density with concomitant problems of disease and shading of both the fruiting and renewal zones. Such cultivars must be grown on long-cane pruned systems. (Figs. 1,5,8)

**Training System and Vine Size**

Conditions of culture can sometimes produce vine growth that is not possible to balance by the taking of additional crop. This can be the result of choosing a very fertile, water retaining site for culture, the choice of a strong, vigor inducing rootstock, an overseaful fertilization program or varying additive components of each.

Under such conditions (the production of more than 0.4 lbs of prunings per foot of row) the employment of a divided canopy has merit. The canopy may be divided horizontally, as in the Geneva Double Curtain (for recumbent cultivars) or the lyre (for upright cultivars), or it may be divided vertically as in the Scott Henry, (Figures 1 - 7) or Mid-Wire Sylovoz.

**Training System and Distribution of Perennial Wood**

Over the course of 30 years we have conducted studies on training systems for a number of grape cultivars. At the outset we chose to avoid the trap of a large trial with all possible permutations on vine training from Fan to Pergola or Arbor. Knowing the growth habit of *Vitis labruscana*, the systems evaluated have been either High Head (Umbrella Kniffen) or High Cordon (Hudson River Umbrella). For most *V. vinifera* the comparisons have been on low head (modified Guyot or pendlebogen) or low cordon (VSP-Cordon).

For resistant hybrids (Baco noir, Marechal Foch, Seyval, Vignoles, Vidal blanc, etc) we employed the four systems shown in Figure 8. This was an evaluation of both low and high systems, and cordon and head systems. For vigorous *V. vinifera* or those whose growth habit was not clear (Cabernet Franc, Cabernet Sauvignon) they were evaluated as with the resistant hybrids.

Thus far, cordon systems have been either equal to or superior to head systems and high has been better than low. This relationship is directly associated with the amount of 2-year-old and older wood in the system. This observation is supported by work in Switzerland (Fig. 1, 12) In that work Guyot training (Low Head) was modified to increase the volume of perennial wood in the trunk. The result was a perennial wood volume increase of 15% - relatively small. Yet, that small increase produced measurable impact on the ripening of Pinot noir vines.

**Do Old Vines Make Better Wine?**

The above data encourage the following speculation. Systems with more perennial wood have larger capacity to store CH2O that can be mobilized in poor growing seasons.

Old vines have larger storage organs where these CH2O resources maybe sequested until conditions require their mobilization. That requirement occurs every spring and possibly in the autumn of those seasons when poor light intensity or a reduced growing season length require additional CH2O for fruit maturation.

This explanation has support from varying sources. Regions with longer growing seasons can produce larger crops. We know from previous work that the annual CH2O production of a vine by photosynthesis is similar for vines growing under the same conditions regardless of crop level. All that is influenced is the CH2O partitioning pattern (3-5).
In cool climate regions we lose leaves at about the same time we harvest the crop. Longer season regions have a period post-harvest that CH₂O may be assimilated via photosynthesis. Such vines can use stored CH₂O reserves to augment the current season photosynthesis during ripening and replenish those reserves before leaf abscission.

If this idea is true, old vines will not make better wine in good years than younger vines do; the advantage will be seen in the poor season. This is a hypothesis. I expect to see it challenged and tested within the next decade. Then we will know whether it is vine age, amount of perennial storage tissue, or some combination that helps produce the best wines.

Choosing A Training System

So, now we are at the “fish or cut-bait” stage. What do we say about training system choices. We would make my decision as follows: 1) unless growth habit, poor productivity at basal nodes, or lack of cold hardiness, make it unacceptable, choose a cordon system; 2) if recumbent, we would choose High Cordon; if upright we would choose Low Cordon with spur pruned bearers; 3) always use double trunks, even on hardy cultivars (especially if a head system is used) and multiple trunks for cold tender resistant hybrid and V. vinifera cultivars.

Most grape varieties of economic importance to Michigan are recognized as to their growth habit. Even those rare here are likely grown somewhere in the Great Lakes Region. Ask opinions, but remember training systems collect adherents as do political parties or religious cults. Work to sort out opinion from data and always make sure that when someone is speaking about a given system of training that it has indeed been grown in the manner of that system. I too often see system names applied to methods that do not reflect the dimensions of that system where it was devised or is most commonly used.

Finally, recognize that some systems are inherently more expensive and/or difficult to grow. Individual grower personalities and site circumstance can be more important than a 10% change in yield. Fortunately, training system is more easily changed than site or cultivar choice. We are all ignorant and seeking enlightenment. It hopefully comes with experience and patience, and the grapevines are forgiving, thankfully.

Acknowledgments

This work would not have been possible but for the support of the Michigan Agricultural Experiment Station, National Grape Cooperative, the Michigan Grape and Wine Industry Council and the Eastern Viticultural Consortium.
Figure 1. Guyot training. Syn. Vertical Shoot Position. Dimensions: Post height - 78"; Fruit bearing wire - 32"; 1st set double wires - 40"; 2nd set double wires - 52"; Top wire - 78". Figure and dimensions after Jackson, 1997.

Figure 2. High Cordon. Syn. Sylvoz. Hudson River Umbrella, Single Curtain, No-tie. Dimensions: Post height - 72"; Fruit bearing top wire - 72"; Optional pair of mobile wires - 48". Figure and dimensions after Jackson, 1997.
Figure 3. Mid-Wire Sylvvoz. Dimensions: Cordon bearing wire - 40"; Lower mobile double wires - 20"; Upper double wires - 58". Figure and dimensions after Jackson, 1997.

Figure 4. Low Cordon-Spur. Syn. VSP-Spur Pruned. Dimensions: Cordon bearing wire - 32"; 1st set double wires - 40"; 2nd set double wires - 52"; Top wire - 78". Figure and dimensions after Jackson, 1997.


Figure 7. Lyre. Divided canopy for upright cultivars. Dimensions: 36" to cordon or cane bearing wires. Vertical walls of canopy 36" apart at base and 48" apart at top. Lower pair wires - 48"; Mid-pair wires -
60" and upper pair wires at 72". After Jackson, 1997.


Figure 9. Variant of Guyot showing small increase in perennial wood by dividing single trunk. After Candolfi - Vasconcelos, et. al. 1994.
Table 1. Changes in dry weight of moderately cropped (2-clusters/vine) potted grapevines at different growth stages.

<table>
<thead>
<tr>
<th></th>
<th>Fruit</th>
<th>Leaf</th>
<th>Shoot</th>
<th>Wood</th>
<th>Root</th>
<th>gm Total</th>
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</thead>
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<td>Fruit set</td>
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<td>11.4</td>
<td>9.0 b</td>
<td>24.2 a</td>
<td>54.4 a</td>
<td>48 c</td>
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<tr>
<td>Veraison</td>
<td>25.0 a</td>
<td>18.3</td>
<td>13.6 ab</td>
<td>12.1 b</td>
<td>31.0 b</td>
<td>193 b</td>
</tr>
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<td>Harvest</td>
<td>28.1 a</td>
<td>14.6</td>
<td>16.6 a</td>
<td>8.0 b</td>
<td>32.7 b</td>
<td>299 a</td>
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</tbody>
</table>

F  ** ns ** ** * **


Table 2. Changes in dry weight of potted grapevines at different cropping levels at harvest.

<table>
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<tr>
<th>Clusters/Vine</th>
<th>Fruit</th>
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<th>Shoot</th>
<th>Wood</th>
<th>Root</th>
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<td>7.9</td>
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<td>8.0</td>
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<td>29.8</td>
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<td>40.7</td>
<td>286</td>
</tr>
</tbody>
</table>

Sig. regression

*** *** *** ns *** ns

Performance of Muscadine Cultivars in Southwest Arkansas

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Abstract

Twenty-one muscadine (\textit{Vitis rotundifolia}, Michx) cultivars were evaluated at the University of Arkansas Southwest Research and Extension Center, Hope, Ark. (USDA hardiness zone 7b). Cultivar differences in yield, berry weight and fruit quality were apparent at this location. The cultivars Carlos, Granny Val, Ison, Jumbo, Nesbitt, Southern Home and Summit were consistently high yielding for all 4 years of data collection. ‘Black Beauty’ and ‘Supreme’ were very productive in 2001 and 2002 (over 100 lbs/vine) despite lower yields the previous two years. Cultivars which yielded poorly included ‘Early Fry’, ‘Scarlet’, and ‘Sterling’. ‘Black Beauty’, ‘Early Fry’ and ‘Sugargate’ had the largest berries, approximately 10 g. ‘Cowart’, ‘Fry’, ‘Granny Val’, ‘Jumbo’, ‘Late Fry’, ‘Nesbitt’, ‘Sugargate’, ‘Sterling’, ‘Summit’, ‘Supreme’, ‘Tara’, and ‘Triumph’ had medium-large berries (6 to 9 g). ‘Carlos’, ‘Doreen’, ‘Ison’, NC67A015-17, NC67A015-26, and ‘Southern Home’ had small berries (5 g or less). Overall fruit quality based on stem scar and flavor ratings, was highest for ‘Black Beauty’, ‘Granny Val’, NC67A015-17, NC67A015-26, ‘Nesbitt’, ‘Southern Home’, ‘Supreme’ and ‘Tara’. ‘Carlos’ and ‘Summit’ also had good fruit quality. Based on yield and fruit quality, ‘Black Beauty’, ‘Carlos’, ‘Granny Val’, ‘Nesbitt’, NC67A015-17, NC67A015-26, ‘Summit’, ‘Supreme’, and ‘Southern Home’ can be recommended for planting in southwest Arkansas and other areas with a similar climate.

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Introduction.

Cold hardiness in woody perennial genera such as *Vitis* is a collection of morphological, anatomical, physiological and biochemical/biophysical characteristics, which allow specific vine cells or tissues to either, avoid (via supercooling) or tolerate the formation and presence of ice crystals within that tissue. When conditions result in either ice formation, as in the case of supercooling, or ice crystals in a hardy tissue ‘seed’ living cells, the result is mortality for the tissue or cell in question. When a cell, tissue, organ or vine is killed we refer to that condition as damage. If the vine, organ or tissue survives that localized damage we refer to it as injury. So, we can have bud kill resulting in damage to those buds, but only have injury with reference to the vine.

In a review on grapevine cold hardiness several years ago (Howell, 2000) I noted that grapevine cold hardiness is not a single vine factor. As suggested above, it is as complex as vine yield or fruit quality. In that review the annual dormant period of vine cold hardiness was subdivided into 3-sections. **Fall acclimation** refers to the period of transition that occurs as a vine and its tissues change from the actively growing, cold tender state to the dormant fully cold hardy state; vine hardiness is facilitated by an early onset and achievement of maximum cold hardiness. **Mid-winter hardness maintenance** is the period occurring after full cold hardiness has been achieved, vines are in various stages of endodormancy (sometimes called ‘rest’) and vines are responsive in varying degrees to hardiness reducing warm periods. and hardiness is facilitated by a) a low level of response to the warm periods; and b) a rapid vine/tissue response to cooling periods post-thaw thus regaining any hardiness lost in the interim. **Spring deacclimation** is the period of transition from the fully hardy state to a condition of complete hardiness loss and the onset of spring growth. The issues for this discussion relate to the last two of these.

The Challenge of Temperature Fluctuation: Cultivar Selection.

Over the last 30+ years we have spent considerable time at an effort that has little glamour, but has had the most important impact of all our research on the quality improvements observed in Michigan’s wine industry. That effort has been cultivar and advanced selection testing. It has also been a frustrating effort as cultivar cold hardiness is a keystone requirement for successful commercial grape production in Michigan. One of the frustrating observations has been the lack of annual consistency in the field ranking of different genotypes. The vineyard rankings from most to least hardy varied to some degree each spring we made the assessment. On closer examination, it became clear that ranking depended on the part of the dormant period that the damaging cold stress episode(s) occurred. Some data we collected on peach cultivar hardiness can illustrate this (Table 1) (Howell, *et al.*, 1997). The hardiest cultivar during acclimation and mid-winter was Redhaven, but it was less hardy during deacclimation; if the freeze occurred during deacclimation, Redskin was most hardy. This kind of data has also been collected for grape cultivars.
It is also a frequent puzzle that a given cultivar can tolerate the cold temperatures of a severely cold winter and then be severely damaged in a comparatively mild winter. Again, when the stress episode(s) occur is a key factor. Thus, cultivar selection is an important component in facing the challenge of fluctuating temperatures generated under continental climate conditions. Wample and his associates (2000) in Washington have reported that there are important cultivar differences with regard to cold hardiness at different parts of the dormant season. They also note that specific tissues may respond differently. Buds are likely to be more responsive to dehardening temperatures than cane or perennial trunk/cordon tissues.

Cultural Factors Influencing Response to Temperature Fluctuations.
There are two primary approaches that can be used with regard to influencing the economic impact of vines to fluctuating temperatures during either mid-winter or deacclimation: a) reduce vine responsiveness to dehardening temperatures and b) accept that fluctuations will produce some injury each year and modify culture to accommodate that injury. Reducing responsiveness is a method of choice regardless of the situation, but it is most critical for those cold tender cultivars marginally adapted to the macroclimate (Geiger, et al., 1995) as vine survival is at stake. Culture that maximizes the expression of the genetic components for cold hardiness is crucial. Among these practices are crop control and vine balance, canopy management to achieve maximal sunlight penetration to the renewal zone and adequate nutrition/water. Delaying pruning of cultivars at risk until just prior to bud burst is also advised. Pruning stimulates growth (Edgerton and Shaulis, 1953) and pre-burst assessment allows for modification of nodes retained.

Cultural modification via ‘spare parts’ (Pool and Howard, 1984) is the common approach employed to compensate for annual losses of buds or canes. We use this on all vinifera cultivars and thus retain multiple trunks and 2-3 times the anticipated needed number of nodes at pruning in anticipation of bud and/or cane injury.

Conclusions.
There are none that are fully satisfactory. Our desire to grow specific cultivars that are well recognized in the marketplace commonly results in efforts to grow cultivars marginally adapted to a given region. While the best response is to select cultivars of quality that are adapted and avoid others, that is not a satisfying suggestion. In Michigan most vinifera fit this situation and the value and perceived quality of such cultivars make them appealing to both grower and processor. So we are left with delayed pruning and spare parts. Those are the primary methods we employ in Michigan. It also means that from time to time we will have the opportunity to deal with retraining vine recovery from freeze damage.

Recovery Approaches After Damage Has Occurred.
Growing cold tender cultivars means that we occasionally will have the opportunity to respond to a severe damage situation (Wolfe, 2000). In January, 1994 we had two severe freeze episodes that gave us the opportunity to assess recovery strategies. Those freeze episodes resulted in all vinifera at the Southwest Michigan Research and Extension Center (SWMREC) save Cabernet Franc, Riesling, Scheurebe, and 2-clones of Pinot noir (UCD 9 and 29) being killed to the snowline.

All vinifera in Michigan are grafted to phyloxera resistant rootstocks, so each fall soil is pulled from the row middle to the vine to provide a cover and protection of the graft union and each spring that soil is removed to prevent scion rooting. If the entire scion cultivar is lost, replant will be required and the process of pulling the rootstock, ordering vines, getting them produced and delivered and subsequent planting and training can easily require 4-5 years with lost production in the interim. We also retain 1-node spurs at the base of the trunks to serve as renewals should trunk mortality occur. All these efforts paid dividends in 1995.
We were concerned with 2-factors in the spring of 1994: a) determining whether the freezes had caused damage and the severity of that damage, and b) how vines killed to the snowline should be handled. The first question was easily answered. No pruning or trunk removal was initiated until after the onset of growth in the spring. Vines killed to the snowline had no shoots arising from canes or trunk tissues above the snowline. This waiting meant that we did not have to anticipate mortality status based on perceived trunk tissue damage estimated based on degree of tissue browning, and we could employ the existing trunk structures to tie-up the tender shoots arising from the scion cultivar just above the graft union. We were very careful as we uncovered the unions.

In handling damaged vines, we retained all shoots. The concern was the predisposition for vigorous, large diameter, cold tender trunk replacement canes if shoot numbers were reduced.

The next question was how to crop the damaged vines. In 1994 the entire \textit{vinifera} crop at SWMREC was lost for all except the above mentioned cultivars. In 1995 we observed that vine growth had been excellent, but we had no basis to estimate the amount of crop we might anticipate. My colleague Dr. David Miller made a suggestion that served as the basis for our approach that year.

The vines were trained to a modified Guyot (Vertically Shoot Positioned, VSP) system with pairs of wires at 40, 52, and 78 inches height. The suggestion was to use shoot vigor as an indicator of that shoot’s capability to ripen the crop. The vines were thinned to 7-shoots/ foot of row and at bloom shoots were assessed for vigor. If a shoot length at bloom was in the space between the 52 and 78-inch height wires, then all clusters were retained on the shoot. If the shoot length was between the 40 and 52-inch wire pairs, then the shoot was thinned to retain only the basal cluster. Finally, shoots with length inadequate to reach the 40-inch wire pair were defruited. The result was very respectable tonnage ranging between 2.5 and 4.0 tons/acre depending on the cultivar. Fruit composition and subsequent wine quality was uniformly excellent.

\textbf{Conclusions.}

Protect graft unions.
Retain 1-node spurs at base of scion cultivar.
Retain all shoots on damaged vines.
Retrain vines using shoots arising from protected spurs just above the graft union.
Maintain effective program of pest control, especially fungus disease control in non-bearing year.
Use vine growth criteria to set crop level the following year.
If used, the removed trunks will have reduced likelihood of developing crown gall symptoms.

\textbf{Literature Cited.}


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Weed Control Strategies in Vineyards

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Dr. Ron Talbert is University Professor of Weed Scientist at the University of Arkansas where he has spent his career, of now 40 years, teaching and conducting research in the field of Weed Science. Dr. Talbert earned his B.S. in Soils from the University of Missouri and M.S. and Ph.D. in Crops (Weed Science) from the University of Missouri. He teaches courses at both the Undergraduate and Graduate level and is especially active in working with graduate students as a part of the University of Arkansas’ internationally recognized weed science program in graduate training. Through the years he and his students have done research on a wide variety of problems associated with the use of herbicides in crops, especially horticultural crops, herbicide behavior in soil, factors affecting herbicide selective activity, persistence and carryover, and now herbicide resistance in weeds. Dr. Talbert is a Weed Science Society of America Fellow, Southern Weed Science Society Weed Scientist of the Year in 1991, Past President of SWSS, received the Distinguished Service Award from Arkansas Agricultural Pesticide Association, a Recognition Award from the Arkansas State Horticultural Society, Distinguished Service Award from SWSS, Research Merit Award of Merit from the U of A Gamma Sigma Delta Chapter, the IR-4 Meritorious Service Award, the Spitze Land Grant Award from the Dale Bumpers College of Agricultural Food and Life Sciences, and the John W. White Outstanding Team Award for his contribution to the grape production team from the U of A Division of Agriculture.

Weed control in grapes requires proper planning to maintain effective season-long weed control. Some of the more common weeds present in Arkansas vineyards include crabgrass, johnsongrass, bermudagrass, primrose spp., ragweed, brambles, nutseedge spp., and red sorrel. If weeds are not controlled, competition for nutrients, water, and light can occur. Competition early with grapes can lead to a delay in growth and ultimately a decline in production in the bearing years. To achieve proper vegetation control, management strategies must be implemented for under the grape row and row middle.

Weed control in row middles can be achieved utilizing four approaches. The first approach employs multiple cultivations with a cultivator or spring tooth harrow. This can be an effective approach; however, multiple tillages are needed throughout the growing season. Erosion of row middles is also a potential problem on hillsides and sites prone to frequent rainfall, therefore making this an option for non-erodible areas only. A second approach utilizes the competitive nature of grass species to compete with weeds. With grasses established in row middles, erosion is minimized. Established row middles allow for travel of equipment in the field throughout the season, whereas cultivation can restrict the use of equipment during wet periods. Care should be taken in selection of grass species when establishing row middles. Grass species, such as bermudagrass, and legumes species may provide good ground cover but can be a problem, when they spread beneath the grape vines. The third approach implements herbicides and the establishment of a grass species in the row middle. Grass is allowed to grow to a target height, then mowed or treated with a reduced rate of a non-selective herbicide, such as Roundup, Rely, or Gramoxone to suppress further grow(Table 1). By allowing establishment of the grass, then suppressing the vegetation, row middle erosion is minimized, travel throughout the season can occur, and weed control has been maintained with
the non-selective herbicide. The last method of weed control involves simply repeated mowing with a flail mower or brush hog to maintain low vegetation cover. This method requires multiple trips across the row middles to achieve proper control. Weeds growing in the middles can be a problem in subsequent years. Also travel late in the growing season can damage branches on established vineyards, so care needs to be taken in late season mowing.

Under-the-row weed control can be achieved using cultivation and/or herbicides. Herbicide applications under the row are specific to the age of the vineyard. Some herbicides cannot be applied to newly established grapes, and others cannot be applied to bearing grapes. Always read and follow the detailed instructions and restrictions on the product label of each specific herbicide. The non-selective postemergence herbicides can be used anytime with care not to spray young vineyard bark or leaves. If spray or spray drift contacts the green bark of the vine, stunting and delayed growth can occur. To minimize bark contact, growth tubes can be used. These aid in training the vines and also to help shield the trunk from spray drift.

There are many selective herbicides that can be used safely and legally on grapes. These include preemergence compounds, applied prior to weed emergence, and postemergence compounds, applied to the vegetation foliage. When the vineyard is in the non-bearing stages of year 1 and 2, the preemergence herbicides Surflan, Devrinol, Gallery, or Casoron can be used. The main control with Surflan and Devrinol is suppression of seedling grasses (Table 1). Gallery is effective on seedling broadleaved weeds. Casoron G can be used, especially in a nursery, but probably is not cost effective in a vineyard (Table 2). Postemergence herbicides that selectively control a wide range of grass species are called graminicides. Labeled graminicides in grapes include Poast, Fusilade DX, and Select. These graminicide-type herbicides control a wide range of grass species, but there is no effect on broadleaf species, either weeds or crops. Therefore, a non-selective herbicide such as Roundup, Rely, or Gramoxone will need to be used for broadleaf weed control. These non-selective herbicides have to be very cautiously used to avoid any contact with the grape foliage.

Karmex and Solicam are two other preemergence herbicides that can be used for weed control in the third year after grape establishment. Once the vineyard is into the third season of growth the only postemergence graminicide that can be used is Poast. Neither Fusilade DX nor Select are registered for use where fruit is produced and marketed. In the forth and fifth year Princep can be used as a preemergence herbicide. Princep is excellent for annual broadleaf weed control but gives only short residual annual grass control.

When focusing on weed control under the row, an understanding of the weed species present is needed. A good management practice does not rely on one class of herbicides, but rather a program approach of preemergence herbicides, postemergence herbicides, and cultivation. By implementing different methods of control, the overuse of one product does not occur, and this minimizes the possibilities of weed shifts and herbicide resistance issues that lead to worse weed control problems.

Under-the-row weed management requires care in proper identification of the weeds present, proper calibration, and care in application. If one of these factors is not achieved, poor weed control or injury to the vineyard can occur. Considerations at the time of application include actively growing weeds, low wind, and optimum weather conditions. If weeds are not actively growing, herbicide uptake can be minimal. If high wind is prevalent, extreme care must be taken to minimize off-target movement. When rain is expected, postemergence spraying should be delayed. By understanding the management strategies available, weed control can be attained.
in either row middles or under the row. By utilizing a variety of herbicides and cultural practices, cost-effective weed control (Table 2) can be attained throughout the life of the vineyard.

<table>
<thead>
<tr>
<th>Species</th>
<th>Preemergence</th>
<th>Gramicides</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Postemergence</td>
<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Annual Grass</strong></td>
<td>E P G G E E E</td>
<td>E E E E E E</td>
</tr>
<tr>
<td><strong>Bermudagrass</strong></td>
<td>P N P N P N N</td>
<td>E E E E E E C</td>
</tr>
<tr>
<td><strong>Seedling johnsongrass</strong></td>
<td>P N P P G F E E E E E</td>
<td>E E E E E E</td>
</tr>
<tr>
<td><strong>Rhizome johnsongrass</strong></td>
<td>P N P N P N N</td>
<td>E E E E E E C</td>
</tr>
<tr>
<td><strong>Annual broadleaves</strong></td>
<td>P E E E E P G</td>
<td>N N N E E E E</td>
</tr>
<tr>
<td><strong>Brambles</strong></td>
<td>P N P N N N N N</td>
<td>N N N E E E C</td>
</tr>
<tr>
<td><strong>Nutsedges spp.</strong></td>
<td>P N P P P P P</td>
<td>N N N C C C C</td>
</tr>
<tr>
<td><strong>Red sorrel</strong></td>
<td>N G P F N N N</td>
<td>N N N E E E C</td>
</tr>
</tbody>
</table>

Table 1. Weed control ratings by species from various herbicides labeled in Grapes. 

1. Data from various sources.
Japanese Beetle, *Popillia japonica* (Newman): 
This beetle is native to Japan, introduced to New Jersey in 1916 and dispersed throughout U.S. including NW Arkansas (1998) and Tulsa areas in the late 1990’s. The host range of adult beetle includes: fruits - apple, cherries, grapes, peach, plums and blueberries; vegetables - asparagus, beets, broccoli, rhubarb and sweet corn; ornamentals - maples, birch, crabapples, roses, sassafras, mountain ash and linden; field and forage crops - soybean, alfalfa, clovers and corn; and weeds - smartweed, crabgrass, ragweed and cattail. The adult skeletonizes the leaves and does feed on some ripe fruit. The larvae (white grub) feed on roots of grasses in: recreational & industrial parks, school grounds, home lawns and golf courses. The adult is 3/8-1/2” in length, the area behind the head is metallic green, the wings are coppery brown and it has 6 white tufts of hairs on each side of the abdomen. The larvae varies from 0.1” to 1” in length, “C”-shaped and hairs on the tip of the abdomen are distributed in a “V”- shape. The larvae overwinter in the soil. As the soil warms in the spring the larvae feed on grass roots. In June they change to a pupa (resting stage) in a soil cell. In late June to early August adults emerge from the soil, mate and females enters soil under turf to lay eggs. Larvae emerge and feed on roots until late fall when they burrow to 8 to 10 inch depth in the soil to overwinter.

Homeowners should make the first insecticide application to foliage when damage is becoming intolerable. Inspect plants for additional beetle damage prior to deciding to make additional insecticide treatments. See recommended formulations and rates in the Arkansas Small Fruit Spray Guide. When possible, replant with plants that are resistant to adult feeding.

Alternatives to insecticides are available for control of the larvae: parasitic nematodes or milky spore bacteria can be applied in the spring or early fall. One treatment of milky spore is usually sufficient since the bacteria continue to multiply in later generations. NOTE: Do not apply chemical insecticides to turf if you apply milky spore or nematodes. Insecticides keep the grub population too low for the spores or nematodes to multiply and persist. Organic growers may achieve some benefit from spraying plant-derived extracts of Rotenone/Pyrethrin against foliage feeding adults.

Japanese beetle adults may also be mass trapped on a community-wide basis. The trap has a yellow baffle and bag with a dual lure: floral lure: 9.9% Phenylethyl Propionate, 9.9% Geraniol, 23.1% Eugenol; and a sex lure: 0.47% (R,Z)-5-(1-Decenyl) dihydro-2-(3H)-furanone.
Sources of the Japanese beetle trap kits: Great Lakes IPM (989-268-5693) kit has 1 baffle, 3 bags, 1 dual lure (sex & floral) = $7.50; and http://doityourself.com/ “bag-a-bug” kit has 1 baffle, 2 bags, 1 dual lure = $6.30. Each yellow baffle can be used for several years but the grower needs to replace yearly the dual lures = $4.00/pkg and the bag (3/pkg) = $2.00/pkg.

To succeed in mass trapping the Japanese beetle, follow these directions and adult numbers should decline over several years. Set out traps by 15 June at a density of 49-traps/sq mile. Each trap attracts beetles from 5,000 sq ft. Do not put traps in or near plants that are susceptible to Japanese beetle. Be sure to empty the trap bags of beetles every other day and destroy them (do not bury beetles because they can dig up to the surface). Crops like grape may require protective insecticide sprays to minimize foliar damage and crop loss in the first
years of the mass-trapping program. Several years of mass trapping is expected to reduce the local population of Japanese beetles. Other states indicated that the Japanese beetle populations dropped over time due to buildup of natural enemies and disease.

Multicolored Asian Lady Beetle, *Harmonia axyridis* Pallas:
The name "multicolored" refers to the many different color forms of the adult lady beetles (see photo). It is a native to Asia that was introduced to the U.S. as early as 1916 to feed on aphid and scale. It was re-introduced and mass reared by the Agricultural Research Service-Newark in late 1970’s. They shipped these beetles from Newark and to Byron, GA, to control aphids and scale on pecan. The first populations of this species were collected in Arkansas in 1992. The predatory species benefits us by feeding on more than 50 species of aphids and other soft-bodied insects that are pests of ornamental rose, crepe myrtle, plum, peach, apple, magnolia, clover, cabbage, vetch, pine, tulip tree, maple and other plants. One beetle during its lifetime can eat 300 aphids. It has nearly eliminated the injurious pecan aphids in Georgia pecan orchards. However, the multicolored Asian lady beetle was reported in Michigan to feed in August/September on ripe raspberries and grapes and contaminate flavor of juice & wine (MSU Rufus Isaacs, University of Massachusetts Berry Notes October 2002). Asian lady beetle adults are attracted to white, gray or yellow buildings and hibernate in wall spaces & enter homes on warm days. Agitated beetles bleed a yellow fluid that stains walls & fabrics. The Multicolored Asian Lady Beetle is ¼" in length, the area behind the head (pronotum) has spots fused into "M" shape. Body color ranges from yellow-orange to red-orange with 0 to 19 black spots on the wings. Other lady beetles can be seen on the “Lady Beetle Guide” at http://cnf.ca/beetle/guide.html.

The life cycle consists of adult beetles laying 20 eggs a day. Eggs hatch in about three to five days. Larvae have white spots on sides of the abdomen and feed on aphids then molt into an immobile pupal stage attached to the leaf. It takes 15-25 days to go from egg to adult.

Solution to these beetles entering houses is to adequately caulk the exterior. Also, camphor & menthol have been shown to repel the multicolored Asian lady beetles.

*Japanese Beetle Internet Sources of Information:*
http://comp.uark.edu/~dtjohnso/japbeetle.html
http://ceris.purdue.edu/napis/pests/jb/imap/jbmap.html
http://www.extension.umn.edu/distribution/horticulture/DG7664.html

*Multicolored Asian Lady Beetle Internet Sources of Information:*
http://ohioline.osu.edu/hse-fact/1030.html
http://www.nysaes.cornell.edu/ent/biocontrol/predators/harmonia.html
http://www.entomology.wisc.edu/mbcn/kyf210.html
http://www.ars.usda.gov/is/br/lbeetle/
http://www.ars.usda.gov/is/AR/archive/mar95/001030.beetlemagstory.htm#harmonia
http://www.umass.edu/fruitadvisor/berrynotes/bn1714.pdf
Diversity of arthropods and other organisms is often seen as an indicator of overall health and stability of various ecosystems, including grape production systems. Diversity can also give direct benefits to grape growers. A build up of natural enemies helps to control grape pests. Even a build up of insignificant arthropods is important; as they become prey for natural enemies when grape pests are not available. This brings about higher stability for the grape ecosystem.

Arthropod diversity can be increased in the vineyard by reducing pesticide applications, or by using softer compounds that have minimal impact on non-target organisms. Another method is to increase diversity of plant material, in the form of crop plants, groundcovers, and/or perimeter plants. Purchasing and releasing beneficial species is yet another method of increasing arthropod diversity.

There are many examples in research literature of how arthropod diversity directly benefits grape growers. Mayse (1998) studied arthropod diversity in California vineyards. He found higher spider counts in vineyard plots that use more sustainable viticultural practices. These spiders may provide effective biological control in these systems. In a separate study (1997) he found higher lacewing egg counts in vineyards using more sustainable practices, specifically using a cover crop and compost for fertilizer, as opposed to vineyards that used synthetic fertilizer and/or cultivation. In the larval stage, lacewings feed on large numbers of immature leafhoppers, as well as other insects. This study reported a significant reduction of western grape leafhopper, a key grape pest in that region, where lacewing counts were higher.

Jay Brunner does similar research in apple orchards of Washington State. He conducted a study (1998) with 10 orchards: 5 using a conventional program for management of several key pests; the other 5 using softer compounds for control of codling moth only. Natural enemies increased greatly in the orchards using softer compounds. The increase in biological control agents in these orchards eliminated the need for additional insecticide sprays against other pests, in contrast to the conventional orchards that did require sprays.

Goal
This project seeks to compare the levels of arthropod diversity in Arkansas vineyards following different pest management programs. Sampling started in the 2002 season, and will continue throughout the 2003 season. An attempt will be made to count and identify (to order) all insects and spiders in each system. Parasitoids and predators will be identified to family.

Objectives:
1) Sample vineyards following different grape management programs; 2) compare levels of
diversity across these programs; and 3) determine what species exist with potential for biological control of grape pests. Vineyards will be sampled for the following known parasitoids/prey: *Trichogramma minutum*/grape berry moth; *Anagrus epos*/grape leafhopper; *Ablerus clisiocampae* and *Prospaltella murfeldtae*/grape scale. My goal is to compare the relative abundance of these parasitoids, as well as other natural enemies, under different grape management programs. I hypothesize that pest management programs using more environmentally safe tactics will have higher levels of arthropod diversity and more potential for biological control.

Methods:
The following sampling methods will be used: pit-fall cups; yellow sticky flags; pheromone traps; and sweep netting. Sampling will be done in three separate sampling locations in each vineyard: center; along two edges; and one edge bordering woods where they exist. Specimens will be collected and taken to the lab, identified, tabulated, and statistical analyses run to determine differences between each vineyard.

Pit-fall traps consist of plastic cups, placed under vines flush with ground level, with a wood cover suspended above. Three traps are placed in each of three locations in each vineyard. Ground level predators are expected to fall into these traps, and will be preserved in anti-freeze inside until they can be collected. Yellow sticky flags are coated with a sticky compound on both sides and attached to the top wire in the vine canopy. Flying insects, including leafhoppers and parasitoids, are attracted to the yellow color and get stuck on these traps. There are three sticky traps per location. Pheromone traps will be used for monitoring of grape berry moth, with one trap per section. Male moths are attracted to the synthetic equivalent of the female sex pheromone and get stuck in the sticky compound inside the trap. Percent of grape berry moth infested grape clusters are also recorded. Sweep net sampling is done in row middles, with three samples in each section. Each sample consists of 10 sweeps; each sweep is a 180° arc at grass panicle level.

Five separate vineyards are sampled in this project. They vary from a very high level of pest management to abandonment. The most intensively managed vineyard, in Lowell, suffers from a recent introduction of Japanese beetle. Weekly insecticide sprays were made in July and early August. Insecticides were also applied for grape berry moth in June and August. In Judsonia, a 2 acre vineyard had several insecticide sprays in July and August for grape berry moth control, although with much less intensity than that in Lowell. This plot is within a 180-acre fruit production system of blackberries, grapes, muscadines, and other crops. The pest complex in a young vineyard in Hindsville hasn’t become established as yet. Therefore, this vineyard gets less insecticide spray than the two previous ones. A vineyard in Gum Springs is a low input IPM system, with a very high level of plant diversity in the ground cover. Only border row applications of insecticide were made to control grape berry moth since this crop is harvested in middle to late July. Pit-fall traps from 2002 sampled so far show a very high level of arthropod diversity in this system. The final vineyard is in Bald Knob. It is a small vineyard, about 4 acres, completely abandoned for at least 2 years. Pit-fall samples from 2002 are showing high levels of diversity here also.

Two additional research plans may be conducted with this project this summer. Each plan will require cooperation with another department or company. The first is the evaluation of a new mating disruption product, Exo-Sex. It consists of a synthetic powder version of the female grape berry moth sex pheromone. Male grape berry moths fly into Exo-Sex traps, are dusted
with this pheromone, and then spread it as they fly around the vineyard. Mating disruption has been shown to work with Isomate-GBM pheromone ties. It is very labor intensive, as the ties must be placed on trellis wires at the rate of several hundred per acre. It is hoped that the new Exo-Sex product will be as effective and more profitable.

Another objective is to compare presence of parasitoids in flowering groundcover versus grass, the standard groundcover in this area. A mix of annual and/or perennial flowers known to serve as important sources of nectar for parasitoids will be maintained in one vineyard, and compared to rows using grass.

Results and Discussion:
Will be provided at the completion of this project, near the end of 2003.

References:

Brunner, J.F. 1998. Apple Production Without the Input of Neuroactive Insecticides. USDA, Western Region Sustainable Agriculture Research and Education program. SARE #94-23.


How to Start a Winery and Not Go Broke

Doug Welsch
Fenn Valley Vineyards, Fennville, MI

Starting a winery is full of risk and the potential for failure or delayed profitability is high. What are some of the things that can be done to minimize the risk, and what are some of the pitfalls that must be avoided to assure success? The formula for success is a strong, well-defined plan executed in conjunction with adequate funding, focus and dedication, with an element of luck.

A good plan is the key to making the venture a success. It will help to keep you focused and will make it possible to secure and efficiently utilize the required funding. The development of a good operational plan involves extensive product knowledge along with visionary thinking tempered with common sense and the touch of reality.

The first step in the planning process is to learn as much as possible about all aspects of the business. This is a very time consuming part of the planning process, but a very necessary step, as the more that you know and understand, the less likely that costly mistakes will be made. You need to spend some time researching and asking questions. Talk to other growers and extension people to learn what you can and can’t do. Talk to distributors and storeowners to find out what is selling and what these people will be expecting from you. Talk to wineries with retail operations to learn what works and what does not work. Begin to formulate how you are going to sell your wine and to whom. And don’t forget to talk to the local and state governments and Federal regulatory agencies.

Learn to differentiate between the things that work in your favor and those that limit what you can do. Decide which factors you can control vs those over which you have no control. See how other people have responded to these outside influences. Look at things like climate, local economics and laws, labor pool, proximity to prospective markets, selling price limitations in your area, transportation issues, and resource limitations. Investigate all aspects of the business, not just the fun and interesting things. What do you know that you can do well? What are beyond your realistic capabilities? And above all, don’t get confused with things that you would like to be able to do or that you would like to be true.

Use spreadsheets and a computer to do some simple modeling to work out scenarios and help develop your plan of attack. Besides being a handy form for keeping records, spreadsheets can help you plan for the future and juggle limited resources for optimum benefit and yield. Setting up models and working out your plans beforehand allows you to make your mistakes on paper instead of in the bottle.

The old axiom that says that the three most important requirements for a successful business are location, location, and location, holds true for a successful winery. The very first and the most crucial decision is the selection of the site. Everything from the grape varieties that can be grown to the means of marketing will be influenced by this decision. If the site was pre-determined by prior ownership or if a region is chosen because of proximity to an existing job or family, there will obviously be less flexibility than if the selection criteria were based solely on factors surrounding the planned operation.

The ideal procedure would be to go through the planning process, and then pick a site that best meets the criteria established by the plan. Usually, it is just the other way around. The site is a given and the operation and spectrum of products must be made to fit the capabilities of the
site.

One must approach this question of, “what products will be produced?” in a pragmatic manner. Sure, it would be nice to grow a great Cabernet, but maybe the site will only support a well-made Chambourcin. A rule of thumb is that you cannot afford to lose more than 1 crop in 10. That could be a 100% failure in one year out of ten, or a 20% loss every other year. Any way that you figure it, vineyards experiencing losses that exceed 10% of the potential yield are most certainly doomed to failure.

On the other hand, a grower could be assured of a full crop with the use of costly and heroic efforts, like burying the vines or some other extreme form of viticulture. But is it worth it? Will the resulting wines be of sufficient quality to support these extreme measures? Or will you be charging $20 for a bottle of wine that is really worth only $12? Common sense says that you can’t do that for very long, especially now in a global economy and a worldwide grape glut. A good guideline is that the cost of the grapes ($/ton) cannot be more than the SRP of the wine multiplied by 100. (A $12 bottle can be made from $1200/ton grapes.)

America talks dry and drinks sweet. Soft and fruity wines will be a bigger hit than huge mouth-filling wines. A successful product line will include two basic wine groups that serve two different purposes. First, there should be a number of popular styled “cash flow” wines that appeal to the masses and generate sales volume for the winery. The second grouping are the “press wines” which include a limited selection of premium varietal wines that will generate press and recognition for the winery.

Are you going to produce wines for all tastes and preferences, or are you going to streamline and focus on two or three wines? The former will appeal to a wider segment of the population and is the best choice if you want to rely on tourist and off-the-street retail sales. This is especially important if your winery is alone and you are likely to draw a very randomized mix of the population into your establishment.

A focused approach is more efficient, but it narrows your prospective customer base to a subset of the population who likes the kinds of wines that you will be offering. This might be a better choice if you intend to market primarily through the three-tier distribution system, as distributors will limit the number of products that they will carry from each brand. Even if your focus is retail, this streamlined approach may work if your retail operation is located in a region well populated with wineries of a like mindset and if you are not planning to sell to customers of every level of experience and expectation.

Select the product mix based on the anticipated market demographics and their buying habits. Fenn Valley sells 85% of the wine produced under the Fenn Valley label at the retail level. We are not in a region well populated with wineries and we feel that we have to offer something for everyone, so the number of products offered range from 30 to 40. Our prices range from $8 for the popular blends to $35 for our Ice Wine. In almost all of the cases, we snagged the customer with semi-dry wines and were there for them when their tastes matured to dry wines.

When selecting your product mix, look at both the short and the long-term picture. You need to have something that appeals to the customer at hand, but these customers will return and you should plan to meet their needs in the future as their tastes mature and change. Our experience is that most tourist winery visitors will be “new” to wine, and most will not have a well-developed palate. For many, wine is still a little intimidating, but these people are willing to experiment and learn. They approach wine with an open mind and for them wine is a food, not a status symbol. Be there for them now, and keep them coming back in the future.
Once the prospective product line is established, the vineyard needs can be determined. Always try to plant to the market instead of marketing what is planted. We use a spreadsheet to set up a model that will allow us to predict our vineyard needs, both now and in the future. By plugging in the various wines to be produced and the varietal makeup of each wine, the number of acres of each variety can be determined. This same sheet can be used to predict future vineyard expansion needs, and with minor modification, it can be used to balance the current year’s grape production with the wine needs for the coming year.

The decisions about how the product line will be produced will greatly impact the initial capital requirements and how quickly positive cash flow can be achieved. The more that the winery is going to do in-house, the greater the capital requirements and the longer the delay until a positive cash flow is achieved.

The choices of whether or not to grow or purchase the grapes must be made early on. Our experience shows that it takes five years to bring a vineyard to full production and that the up front costs for an acre of vineyard is between $8,000 and $10,000. An alternative might be to initially purchase grapes, and plant vineyards as time and finances allow. Even if vineyards are planted at the onset, you might want to consider purchasing grapes for the first three or four years to generate some revenue while the vineyards are maturing.

Keep in mind that the only real reason that a winery should own a vineyard is for marketing and public relations purposes. While fruit quality may seem to be a concern and the argument can be made that a vineyard under the winery’s control will produce superior fruit, there are ways to get cooperative growers to do a good job, and even the winery owned vineyards can produce inferior fruit on occasion.

The same considerations apply to wine production. The choices range all the way from buying bottled wine ready to sell, to producing and bottling the wine in house and anywhere in between. Again, the more that the winery does in-house, the greater the capital requirements.

About 50% of Fenn Valley’s total production is custom fermenting and bottling for other wineries. About half of those wineries have been in business ten or more years and they find it more expedient to farm out the production of some of the specialty and volume products than to make them in house. The other half are new winery enterprises for whom we custom produce most or all of their wines while they direct their resources toward marketing and sales. These wineries are planting the vineyards and building the production facility as time and money permit.

Just as with growing the grapes, the only real justification for doing the processing in house is for the marketing and public relations benefit. The quality of a wine produced in house need not differ significantly from a wine produced off premise, and may actually be superior because of the technology available to the off-premise producer. However, wines produced off-premise may lack the individual characteristic or signature of a wine produced and bottled in-house. And finally, an argument for producing your products in-house is the personal satisfaction of having done so, especially if the owner is involved in the winemaking process.

Marketing and sales are the single most important aspects of running a winery operation, and at the same time this is the area that is most often overlooked. Marketing is not as “sexy” as wine growing, but it is the one thing that will make or break each and every winery. Everyone believes, “make it and they will beat a path to your door.” The fact is, that you can make it and they will not come. In truth, 50% of available resources should be devoted to sales & marketing and 50% used for administration & production. Too often, production and administration receive
priority, while sales and marketing get whatever is left over.

It is almost a universal given that unless you are planning to implement a particularly large winery operation, the best way to market your wines is through a winery outlet or tasting room. As with everything else that is done in-house, retail sales have a greater up front capital requirement, but there is the potential for a substantial return on the investment. Besides cutting out the middleman, the real advantage of having a tasting room and the associated retail sales is the advertising and promotion that results from the personal contact that customers will experience in your tasting room. Each winery has a unique story to tell, and an effective retail operation will permit you and your staff to tell each and every customer your story. If the wines are good and the customer had a good experience, they will tell other potential customers and your winery benefits from the free advertising. We regard it as “advertising that pays.”

Tasting rooms do not come without a price. Besides the initial cost, tasting rooms take time and talent to manage, the hours are unfavorable, and an extensive and diverse product line is often required for a successful retail operation.

Regardless of the fact that a retail room is good advertising for the winery, a successful retail operation requires external advertising to promote it. We have done surveys of our customers and found that besides word of mouth, highway signs and brochures were the most effective means of reaching first time customers.

Brochures should be simple one-third page, two sided pieces that provide a sample of your story as well as the pertinent facts that a visitor needs to know, such as hours and how to get there. Don’t waste money on a multi-panel brochure that details everything about your operation, when all you want to do is entice the person to visit the winery. If you want a piece that tells your whole story, produce a separate and more elaborate “in-house” brochure to hand out once the customer has made the visit. Avoid being too descriptive of products and activities that may change before the supply of brochures is exhausted. Finally, distribution and placement of your “outhouse” brochures is far more important than “glitz”. Put your money into placement rather than into design and printing. Use brochure placement services to get your brochures out. To avoid waste, limit brochure distribution to within 1 hour of your retail operation and at all state welcome centers.

Advertising is one area that can quickly eat up a substantial sum of money. Use your advertising dollars wisely by avoiding the duplication of the efforts of regional organizations. Join CVB’s and local Chambers of Commerce, then let them do the advertising and promotion to get visitors into the area. Once the visitors are in your area, it is now the winery’s job to entice the visitor to the winery. Focus your advertising dollars locally.

After brochures, locally distributed travel guides are the most efficient printed advertising. We routinely see travelers carrying travel guides into our winery and over the years we have found them to be an effective way to reach visitors in the area. The least effective means of reaching tourists is through newspaper and radio advertising.

Once you have snared a customer, you need to keep them coming back. Our surveys have found that slightly over 50% of the purchases and more than 60% of our retail dollars are from customers who have visited us within the last 12 months. To make use of this customer base, you must employ two marketing strategies: 1) communicate with the customer on a regular basis, and 2) give the customer a reason to come back.

Communication is best handled with a newsletter. Your newsletter must be an extension of your operation. It must be interesting and informative, and should not be a price list in disguise.
Your customers want to hear more of your story, so use your newsletter as a means of reaching them in their homes. Tell them what is happening at the winery or in the vineyards. What is working. What didn’t work out and why. New products and dropped products. Make it personal, let the reader in on some secrets or get to know you and your operation a little better.

Publish your newsletter on a regular basis, not just when someone has some free time. A newsletter need not be flashy to be effective. If your winery is a down-home farm winery, then a simple publication will suffice. Our newsletter is a four-panel publication with two colors on the outside and one color on the inside. The contents are far more important than a glitzy colorful publication. That does not mean that you need to farm out the newsletter to a commercial marketing firm. An effective piece can be produced in-house by someone with a knack for writing using a popular desktop publishing system like Adobe PageMaker.

The biggest pitfall with a newsletter is the list of names to whom the publication will be sent. We want to target serious wine buyers, so we solicit anyone who makes a purchase of $25 or more to sign up for the newsletter. Once the list is created, it is easy to lose track of whom visited and when, in which case the list will grow to tens of thousands of names, most of which will never visit your winery again. At a cost of $0.55 per piece mailed, you must have a way to control who gets your mailings. At Fenn Valley, our mailing list is integrated with the cash register software such that it is very quick and easy to “update” a customer’s entry with their visit date and sales information. Then, when it is time to do a mailing, we send pieces to those who have made a purchase within the last 16 to 18 months, thus keeping our newsletter costs contained to a reasonable level. A good mailing list can be selected and the mailing targeted based on zip code (region), purchase volume, date of last visit, and events attended during the last year. If you are not able to control your audience, then your newsletter will lose its cost effectiveness and become a burden rather than an asset.

Giving the customer a reason to return is the second marketing strategy to consider when reaching repeat customers. Repeat customers may return to buy more wine, but they will return if there is a special event that interests them. Open House, Nouveau Fest, winemaker’s dinners, cooking demonstrations, guided vineyard tasting-tours, concerts and recitals, and special tastings are events that Fenn Valley uses to make our winery a destination for a return visit. Use your newsletter to advertise upcoming events and generate customer excitement. Every time a repeat customer visits your winery three things take place: 1) they have a good time and take home pleasant memories, 2) they buy wine, 3) they usually bring friends and introduce them to your winery. To that end, our motto is that we are not just selling wine, we are selling a good time.

Even though an event is actually a form of promotion, it is a good idea to ensure that all events at least break even. You may not make much if any money, but you need to at least cover your out-of-pocket expenses and some of your labor costs. Over the years we have found that a successful event requires two components: 1) a unique and fun activity, 2) special product promotion or sales incentive (discount). The unique and fun event alone will attract many participants, and the sales incentive will turn the event into a retail success.

Once you have gathered the information and have an idea what you want to accomplish, it is time to develop the operational plan that will guide you to your goal. More than a business plan that a banker may want to review, this plan actually outlines everything from the vineyard production through the final marketing techniques that will be employed. The plan in mind really amounts to a “strategic plan”, which should be an ongoing and dynamic part of any business, regardless of how many years it has been in operation.

The concept of developing a strategic plan is to work from broadly defined ideas toward
narrowly defined goals, ending with a list of the steps needed to implement the plan. There are many planning models to choose from, and each business needs to choose the model that best suits the personality and style of the owners. Plans can range from highly organized structures with various levels of objectives, goals, and strategies to simple flow charts and time lines. The important thing is to go through some sort of a structured planning process to force the planner to review, evaluate, prioritize, and quantify the ideas and aspirations. The purpose is to end up with a detailed progression with the associated estimated costs.

The hierarchy of any plan begins with the statement of purpose at the top. This might best be described as the mission statement, a brief one-sentence statement that summarizes the purpose and function of the endeavor. This statement defines who you want to be, what image you wish to portray, and who your customer will be.

Once the Statement of Purpose has been set down, now it is time to put the whole operation together on paper. Begin with the marketing strategy and the needs of prospective customers when planning your operation. Let the market dictate to production, and not the other way around. By the same token, be realistic in what you can do reliably and efficiently.

How are you going to sell and to whom? What facilities are needed? What are the steps, completion dates, and the costs to complete these facilities? What products are going to be sold? What are realistic selling prices? What can I produce that will fit the market? What are the steps, completion dates, and the costs to set up the vineyards and the winery?

Regardless of the planning method that you employ, the individual steps with the associated completion dates and costs should be fully defined so that you will be able create time lines to help estimate cash flow and funding needs for the various phases of the project. Unless you have an ongoing source of funds, it is crucial to develop cash flow scenarios to be sure that you don’t run out of funds at some critical point early in the game.

Most people will need to secure outside funding at some point during the development phase. Funding for capital purchases, machinery, plants, buildings, etc., is usually readily available, as the assets become the security in the loan note. Operating funds are more difficult to come by because of their nebulous nature. The usual reason for a new business failure is the lack of sufficient operating capital. Be sure to allow for all utilities, labor costs, taxes, and something for yourself. Then increase this estimate by up to 50% to cover the unexpected expenses that you haven’t even dreamed or heard about. Finally, figure on showing no profit for 8-10 years. If you begin the operation with adequate funding and realistic expectations, you will most likely succeed in the end.

Use your operational plan to develop a model to estimate your cash flow projections once you are up and running. Using best guess projections for sales and operational costs, develop cash flow models for each of the first ten years of operation. What is your estimated Cost of Goods? Will there be enough margin to pay wages, allow for future growth, and service the debt load? Your banker or other source of funding will want to be sure that you can meet your expenses and pay off the loan. Although a winery operation may be someone’s dream, remember that to the outside world, it is a business and it must be run like a business.

The operational plan will help you stay focused and not stray on some tangential path that often leads nowhere. An operational plan is dynamic and should be revisited annually to be updated as circumstances change or as the various steps and goals are accomplished. Keep in mind that the goals and objectives of the business will change over time from the basic developmental issues to improvements and additions once you get your feet wet. Use the operational plan to determine what tasks need to be done to permit the business to grow and
prosper, and to effectively communicate these goals and tasks to your employees and associates. Knowing where you are going and staying focused on the light at the end of the tunnel will ultimately allow you to reach your goals and make your operation successful.