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MITIGATING RISKS IN COST-SHARING MACHINERY AND LABOR IN SMALL VINEYARDS IN THE SOUTHERN UNITED STATES

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Growing wine grapes is labor intensive. Vineyard owners need options that address a chronic labor shortage during critical growth stages. Labor has become more expensive and increasingly scarce, especially for the small-acreage vineyards that do not have enough work to justify employing an employee year-round. Labor needs vary by vineyard size and type. The need for additional labor was reported by more than 90 percent of vineyards in Texas, regardless of size (Fig. 1).

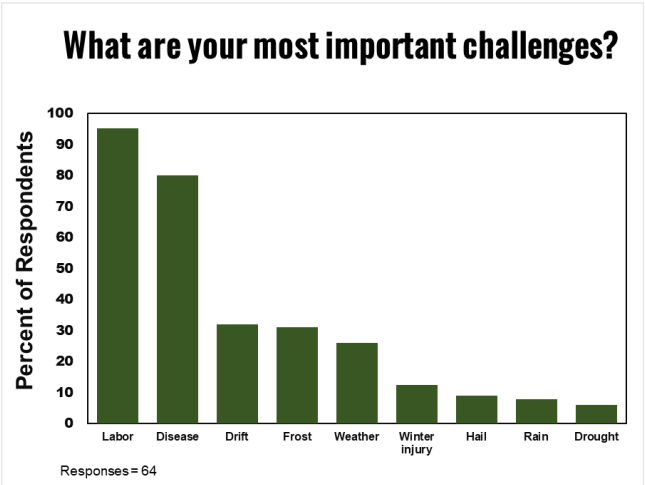

Figure 1. Survey response from Texas Crush Report and Vineyard Production Survey for crop year 2021 to the question: "What are your most important vineyard challenges?"

While a single individual may be able to farm several acres of grapes with only seasonal labor, mechanization becomes increasingly important for tasks that are time sensitive. Harvest is the most time-sensitive task, and a matter of 2 days can make a significant difference in the value and marketability of a crop.

Many vineyard tasks can be accomplished by mechanization, and the benefits of doing so can include significant savings of time and money. In some cases, the results are also more consistent (Fig. 2).

Figure 2. Machine-harvested fruit (top) can be as clean and free of foreign materials as hand-harvested fruit (bottom).

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A mechanized harvest can offer tremendous advantages. But harvesters are typically the most expensive single piece of equipment for vineyard owners.

Grapes are the highest value fruit crop and are widely grown across the United States (USDA-NASS, 2022). Most of the grape production is used for wine. When the value of wine is added, the total economic impact is $276 billion. As a high-value fruit crop, management practices to improve yields and quality are common, such as manipulating the canopy microclimate by leaf removal and hedging or reducing crop size by cluster thinning. Virtually every vineyard uses machinery, but small vineyards lack economy of scale to replace labor with single ownership of high-cost machinery.

The purpose of this project was to assess labor and equipment limitations, risks, and benefits of different cost-sharing options. Sharing allows growers to share their strengths and form deeper relationships within their agricultural community, in addition to the time, labor, and cost-cutting advantages. Beyond the high cost of equipment, a large deterrent to sharing equipment lies in the loss of autonomy and control in vineyard management (Table 1).

Table 1. The advantages and disadvantages of sharing vineyard equipment.

Advantages	Disadvantages
▸ Lower equipment ownership and operating costs ▸ Lower debt load and ability to use capital for other purposes ▸ Access to newer, more efficient or specialized equipment	▸ Loss of individual control ▸ Ownership, operations, and maintenance issues ▸ Coordination and cooperation with partners—availability during critical time windows

It is important that partners examine compatibility of the vineyards' characteristics under consideration for sharing, such as sharing suppliers or having similar trellis and training systems. The partners must have compatible characteristics as well, such as goals, work philosophies, skill sets, experience, and financial status. Note that the partners' characteristics need not be comparable, but compatible. Compatible partners have the potential to share talents and strengths, while shrinking the effects of individual weaknesses.

The purpose of this research is to provide a means for growers to understand, learn, decide, and perhaps apply an option to high-input labor by illustrating the options in sharing production, finances, and strengths of small vineyard operators.

To identify and prioritize the vineyard tasks that most commonly demand additional labor or expensive equipment, an anonymous Qualtrics survey was created. Seventy-six winegrowers responded.

All vineyards surveyed employed at least one form of mechanization for spraying for pests and diseases and/or weeds. Most vineyards also owned a utility vehicle and trailer (Fig. 3).

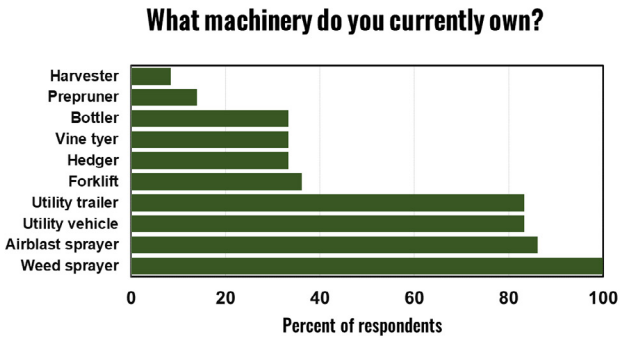

Figure 3. Equipment ownership reported by survey respondents.

The specific production practices that a vineyard employs can vary widely based on the type and use of grapes grown and from one region to another. To better understand the specific needs of small vineyards, a survey was conducted by 69 wine grape vineyards in Texas that ranged in size from 30 acres to less than 1 acre (Fig. 4). A maximum size of 30 acres was selected based on common vineyard sizes in the state that do not rely heavily on mechanization.

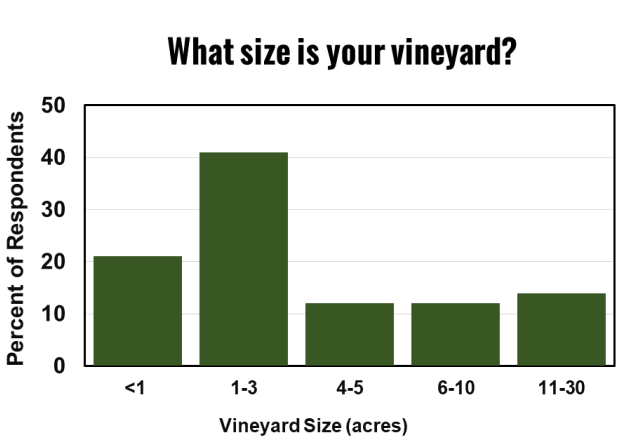

Figure 4. Vineyard sizes reported by survey respondents.

The two respondents with the largest vineyards reported owning harvesters. When asked what equipment they were interested in purchasing, no respondents indicated interest in purchasing a harvester, but half of the respondents indicated they would consider sharing a harvester (Fig. 5).

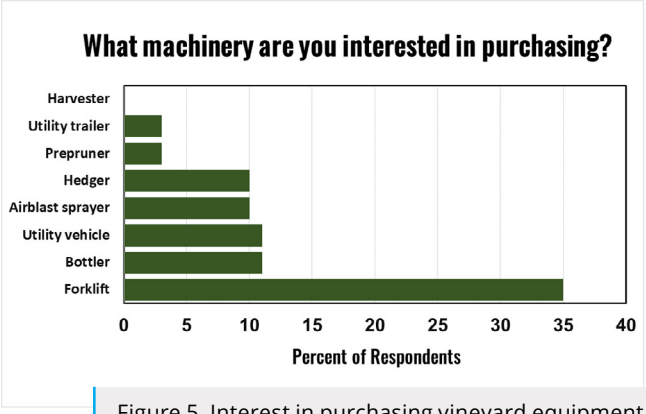

Figure 5. Interest in purchasing vineyard equipment reported by survey respondents.

The economics of mechanization has been recently discussed in publications (Kurtural & Fidelibus, 2021) and case studies frequently show greater profitability with mechanizing laborious tasks, such as pruning, canopy management, de-suckering, and harvest. However, the most common barrier to equipment ownership for small vineyards is scale. The advantages of economies of scale include lower equipment and ownership costs, lower debt load and ability to use capital for other purposes, and access to newer, more efficient, or specialized equipment. One way to reduce equipment costs is equipment sharing. Survey respondents were asked which machinery they would consider sharing, and a harvester was the most popular item, with 50 percent of respondents reporting a consideration in sharing it (Fig. 6).

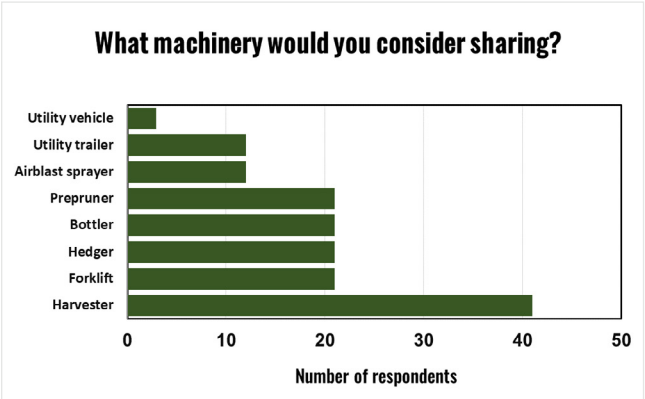

Figure 6. Interest in sharing vineyard equipment reported by survey respondents.

VINEYARD EQUIPMENT SHARING

A detailed guide on farm equipment sharing published through the Sustainable Agriculture Research and Education (SARE) program describes four categories of sharing models employed commonly throughout the United States (Fig. 8). Further consideration is provided to determine the feasibility of sharing, such as calculating the financial feasibility, user fees, equipment maintenance plans, scheduling, and assessing interest in equipment sharing.

Forming a defined equipment ownership operation provides the structure for the potential of preserving good farming relationships. Certain operational considerations should be considered, such as:

Costs

- Ownership costs
- Financing costs
- Depreciation
- Operational costs – insurance, storage, fuel, fluids, repairs, administration, operator costs

Legal Entities

- Direct co-ownership
- LLC
- Cooperative

Fee Structure

- Annual membership fees
- Per-use rental fees (per hour, per day, per year, per acre, per vine)
- Direct expenses billed to the user

TYPES OF EQUIPMENT SHARING

Direct Co-ownership

May/may not be formal, familial, or need to have a clear written agreement

Shared Equipment Business

Legal structures, such as LLCs, own equipment that may be used or rented by members.

LLC limits the liability of participants and facilitates transitioning members in/out of the organization.

Equipment Cooperative

A type of corporation designed to be owned and governed by its members. This more set and formal structure can be an asset—removing uncertainties in forming a group business.

Tool Lending Networks or Libraries

Tool lending libraries are typically administered by a local governmental agency or a non-profit organization.

The feasibility of equipment sharing for small vineyards in Texas was assessed through interviews and a focus group with small growers. Ultimately, the sharing of most vineyard equipment, particularly harvesters, was deemed impractical for reasons other than financial. The most common reasons for the unlikelihood of equipment sharing were unsuitable infrastructure, conflicting time of need, and distance of producers from one another (Table 2).

Table 2. Vineyard mechanization and equipment-sharing checklist.

- ☐ Is there sufficient interest among producers in proximity?
- ☐ Is the equipment compatible with need?
- ☐ Are the logistics feasible (e.g., availability of transport equipment, access to property)
- ☐ Are skilled operators available to use and maintain equipment?
- ☐ Is there capacity to maintain and store equipment?
- ☐ Will current equipment support mechanization (e.g., tractor horsepower and sizing)
- ☐ Does the design of the vineyard accommodate mechanization (e.g., headland to turn about equipment, appropriate trellis, and training system)
- ☐ Can you and/or a sharing partner(s) provide lodging for the worker to rest?

Custom machine harvesters prefer to work at night in the Southern United States to take advantage of cooler weather. Mechanized harvest equipment is expensive and highly specialized and requires an experienced operator and assistant. Additionally, most mechanical harvesters require a lowboy or removable gooseneck (RGN) trailer for transport. The fees for transporting the machine, plus the time and transportation of necessary personnel, can be included with the custom harvest fee.

Figure 7. Custom harvester picking a Blanc Du Bois 2-acre vineyard trained to a modified Watson training system. To accommodate mechanical harvest, the trellis crossarms were shortened from 48 to 18 inches.

Since a night harvest is preferred for a custom machine harvest, lodging and a meal must be offered. Though expensive, custom machine harvests are appreciated by growers for the ease of harvesting. They can be profitable for small vineyards when yields are high enough to justify the costs (Fig. 7).

DETERMINING LABOR NEEDS

Vineyard work can be physically demanding, and the tasks are time sensitive, which leaves a narrow window of opportunity to complete the tasks. The key stages in grapevine growth and development require both skilled and unskilled tasks. The labor market is extremely competitive for those skilled and experienced in the vineyard. Even unskilled workers can be hard to find. Every task needs a certain level of training and direction. Sharing workers can potentially create enough work to warrant full-time employee status that will negate the need to retrain new workers every season. Begin by prioritizing vineyard tasks that are most critical timewise and require a skill level that the vineyard owner or manager can delegate to another person or to a machine. An example is shown in Table 3.

Table 3. Prioritizing labor-intensive and time-sensitive task.

Growth Stage	Task	Skill Level
Dormancy	Pre-pruning	Minimal, mechanize
Rapid shoot growth	Shoot thinning Final pruning	Moderate High (experience)
Fruit set	Leaf pulling Crop thinning	Moderate High (experience)
Veraison	Fruit drop Hedging Bird netting	High (experience) Minimal, mechanize Minimal skill
Maturity	Harvest	Minimal, mechanize

LABOR SOURCES AND CUSTOM WORK

Many farming operations utilize custom or contract work for specific or timely tasks. This can provide access to specialized equipment or labor that is otherwise not available. For less-developed industries, access to custom work may be limited, but when available, it can provide a range of benefits, particularly at harvest and for other time-sensitive tasks.

Vineyard owners and managers must be creative in finding other projects for the valuable skilled and trained people to do so that they can be available during critical times. Their expertise (and value) can increase over time. Our survey revealed that scheduling harvest at the fruit's optimal maturity weighs most heavily of all vineyard tasks. Therefore, this study examined some harvest options available to small vineyards: hand-harvested by volunteers, hand-harvested by temporary workers, hand-harvested by a managed crew of H-2A visa workers, and harvested by machine.

HAND-HARVEST

Regardless of the source of labor at harvest, adequate buckets or lugs must be readily available for each picker. Valuable fruit is often left behind when clusters are small or difficult to find in the best of harvests. However, when a picker must carry their bucket to a harvest bin to empty it or, worse, when said harvest bin is not conveniently located, then valuable time, momentum, and motivation are lost. What to do? Have dedicated workers regularly drop off empty buckets or lugs near pickers and pick up and empty any full buckets.

CUSTOM FARMING

In custom farming, vineyard tasks are contracted by the vineyard owner with a custom farming entity. Inputs from the vineyard owner include payment as agreed upon and any other facets, such as lodging and food for all workers. Contracts that outline the specific expectations and responsibilities of the vineyard owner and custom farming entity can prove to be constructive to maintaining good relations. Accurate and current records are helpful in creating an agreement that is satisfactory for both the vineyard owner and custom farming operator.

Custom farming fees are higher than temporary day labor, but the crews are managed by a crew leader. The success of custom farming traces back to the skills and leadership of the crew's manager. Well-managed crews have been known to be professional and motivated. Food and lodging for crews can be shared among vineyard owners (Table 4).

Figure 8. Custom hand-harvest at night by H-2A workers.

Table 4. Considerations for custom farming.

- ☐ Can you and/or a sharing partner(s) offer lodging to all custom operators?
- ☐ Can you be clear regarding expectations and responsibilities of the vineyard owner and of the custom operator, such as management, price, transportation of workers, transportation of harvested grapes, who provides supplies and equipment, etc.?
- ☐ Do you keep good records?

VOLUNTEER HARVEST

In small vineyards, it is common to join a cadre of volunteers made up of family and friends at harvest (Fig. 9). For volunteers, the work allows for fellowship and a chance for physical outdoor work. Most volunteer-driven harvests begin at daybreak, so the harvest is completed by or before noon, at which time lunch and wine are served. Depending on the vineyard, wine or entertainment might be included for the harvesters in an offer of goodwill and hopes volunteers will return for future harvests. The costs are minimal. However, the vineyard and winery must agree on the harvest date well before ripening to organize volunteer recruitment. Enthusiastic volunteers often pick one to several harvests during a season, but only one per day. Returning volunteers acquire experience, but each vineyard tends to harvest a bit differently. A brief overview of safety training and harvest instructions is needed at the start of the day (Table 5).

Figure 9. Harvests by volunteers are common in small vineyards.

Table 5. Checklist for a volunteer harvest.

- ☐ Keep an updated list of potential volunteers.
- ☐ Provide safety training and brief harvest training for the volunteers.
- ☐ Maintain correspondence with volunteers throughout the year.
- ☐ Plan to provide incentives for each picker, such as a bottle of wine or music.
- ☐ Have the necessary supplies ready: harvest knives or shears, lugs or buckets, bins, gator, and water.
- ☐ Hedge vine shoots for easier access to clusters.

PAID LABOR, AS NEEDED

The supplies and preparations for harvest with as-needed paid labor are very similar to preparing for volunteers. Though more costly, finding workers for pay can be easier than organizing enthusiastic volunteers. The vineyard owner manages all harvest logistics and individual pickers. Pickers are paid by the hour, the day, or piece rate (i.e., by how much they pick) (Table 6).

Table 6. Checklist for labor for pay, as needed.

- ☐ Keep an updated list of potential volunteers.
- ☐ Provide safety training and brief harvest training for the volunteers.
- ☐ Maintain correspondence with volunteers throughout the year.
- ☐ Plan to provide incentives for each picker, such as a bottle of wine or music.
- ☐ Have the necessary supplies ready: harvest knives or shears, lugs or buckets, bins, gator, and water.
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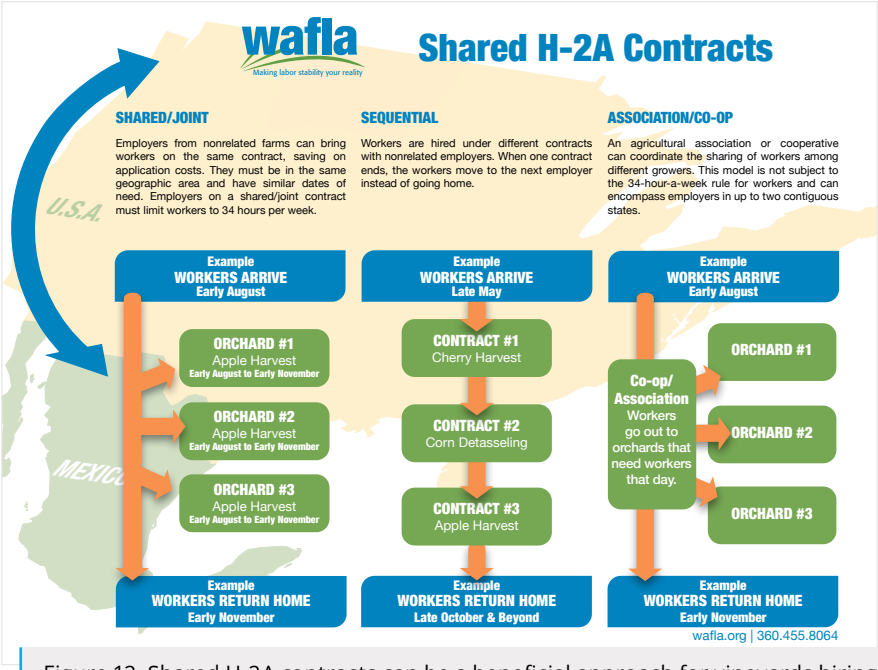

Figure 12. Shared H-2A contracts can be a beneficial approach for vineyards hiring labor to help with harvests. Used with permission from wafla.org.

H-2A TEMPORARY AGRICULTURE WORKERS PROGRAM

The H-2A Visa Program can help farmers fill employment gaps by hiring temporary workers from other countries. The H-2A Visa is designed specifically for seasonal, peak load, or temporary workers in agriculture settings. Trained workers often return to the same farm over the years, which can be a bonus (Fig. 12). Employers must show a need for temporary work that cannot be filled domestically, and the workload cannot exceed 10 months. This approach has been successful for many vineyard operations. Workers can be shared with other vineyards and non-related farms. The contract for hiring through the H-2A worker program outlines the employer's responsibilities, including contract fees, transportation costs to and from the country of origin, housing, food, and transportation (Table 7). Details on hiring through the visa program are available through the U.S. Citizenship and Immigration Service under the U.S. Department of Labor.

Table 7. Considerations for H-2A labor.

- ☐ Be prepared to manage the paperwork and reporting requirements or hire someone who can.
- ☐ Prepare to keep workers busy with employment for at least 7 months.
- ☐ Can you and/or a sharing partner(s) provide housing and transportation for the worker(s)?
- ☐ Can you accept language barriers if there are any?
- ☐ Create a list of farms, vineyards, and agribusinesses to potentially share labor with.

In summary, risks in sharing costs of labor or the cost of owning machinery are comparable. Hiring labor must follow labor compliance requirements and limit liability issues, while equipment depreciates and requires overhead, regardless of returns on the investment.

Skilled workers have high value, and their value is evident during critical peak times. Finding what motivates a skilled laborer can help these valuable people stay and be available during critical or unexpected times of labor need. A sense of stability in employment and money can be great motivators.

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SOUTHERN EXTENSION RISK MANAGEMENT EDUCATION

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