RODALE INSTITUTE™

# ORGANIC CONSULTING

**AGRONOMIC GUIDE**

## GROWING ORGANIC ELDERBERRIES

**Idaho • Montana • Oregon**
**Washington • Wyoming**

# WHY ORGANIC?

Organic farmers are required to use practices that protect soil health, water quality, and biodiversity. USDA certified organic agriculture also does not permit the use of synthetic chemical pesticides, synthetic fertilizers, or genetically modified organisms. This combination of practices reduces the risks of human, animal, and environmental exposure to potentially toxic materials, can reduce greenhouse gas emissions soil erosion, and can promote wildlife habitat and diversity.

## LIKE OTHER ORGANIC PRODUCTS, TRANSITIONING TO ORGANIC ELDERBERRIES MEANS

1. All production activities are accomplished according to USDA organic standards

2. No substances prohibited by the USDA National Organic Program are applied for at least three years immediately preceding harvest

3. All production systems are managed using practices that preserve ecological balance and biodiversity

# WHY ELDERBERRIES?

## CONSERVATION

There are extensive environmental benefits associated with elderberry production. The flowers support pollinators and a variety of beneficial insects, while the leaves and berries provide food and habitat for many different species. Elderberries are commonly used in restoration projects and riparian plantings because of their vigor, suitability for a variety of soil types, and ability to withstand a range of climatic conditions. Riparian buffers are plantings located along streams, lakes, and wetlands which provide stabilization, filtration of sediment from runoff, shade and shelter for fish, protection from flood damage, among other habitat, recreation, and economic benefits.

## HUMAN HEALTH

Elderberry products, including juices, extracts, and fruits, are considered a valuable medicinal herb and food by many cultures. Elderberries contain high levels of anthocyanins, which have been shown to be a powerful antioxidant with a wide range of benefits for human health, such as anti-inflammatory properties and improved cognition. The complete benefits of elderberries for human health continue to be discovered.

## ECONOMIC

Demand for local and organic products is continuing to grow in the Northwest, as is demand for nutraceuticals and “superfoods”. Growing elderberries for flowers, fruits, or conservation benefits can all provide increased economic opportunities and diversify on-farm income. Value-added processing can further increase a farm’s revenue from growing elderberries.

## REGIONAL SUITABILITY

Blue (left) and American black elderberry (right) are grown and managed using similar practices

American black elderberry (Sambucus nigra subsp. canadensis) and blue elderberry, sometimes called Mexican elderberry, (Sambucus nigra subsp. cerulea) may both produce viable crops in areas of the Northwest. Although genetically distinct, the production practices and environmental services provided by these crops are similar between the two subspecies. European black elderberry (Sambucus nigra subsp. nigra) is widely grown in Europe and is beginning to be developed for production in North America, however this subspecies is generally considered less cold hardy and has not been tested as extensively for production in the Pacific Northwest.

# BASIC PHYSIOLOGY

## ARCHITECTURE AND GROWTH HABIT

American elderberry is typically grown as a multi-stem bush. The plants have a shallow root system and frequently send up new shoots, also called “canes”.

## BEARING HABIT

The elderberry flower is a cyme which typically develops on the current season’s, one-year-old, and, less abundantly, two-year-old wood.

## FLOWERS AND FRUITS PHENOLOGY

Trees will begin leafing out in early spring, with flowers beginning to develop in late spring. Fruit is typically ready to harvest in mid- to late summer, though the timing can vary drastically depending on climate.

# SOIL & WATER REQUIREMENTS

Elderberries are tolerant of a range of soil and water conditions and can produce a good crop even with suboptimal soil or water availability, however, providing adequate water, nutrition, and sunlight will maximize yield potential.

## SUNLIGHT

For maximum production, elderberries should be grown in full sunlight. Plants should be spaced to optimize light interception by the canopy, which will vary depending on cultivar, pruning methods, and other management practices.

## DRAINAGE

Elderberry plants can tolerate short periods of flooding, but good soil drainage is important, plants will not survive long periods of inundation. Additionally, if trees are inundated by floodwater, they cannot be harvested for human consumption due to food safety concerns.

## WATER

Regular irrigation during the first year after planting is especially important to ensure roots do not dry out. In subsequent seasons, elderberries may be able to withstand dry conditions during certain times of the year, but adequate water during fruit set and ripening is important. For larger plantings and in more arid regions of the Pacific Northwest, permanent irrigation will likely be required. Hand watering may be sufficient for smaller plantings or in wetter and cooler regions.

## SOIL PH

While elderberries will tolerate a range of soil textures and fertility, the recommended pH is between 5.5-6.5. Growers should conduct a soil test prior to planting to ensure adequate fertility and pH and adjust as necessary before establishment.

### TOOLS FOR ORGANIC GROWERS

Increasing the organic matter of the soil will increase soil water holding capacity, allowing a grower to water less frequently. Organic growers can build soil organic matter by incorporating compost, fresh (uncomposted) plant materials, or animal manure into the top few inches of their soil prior to planting, and reapplying as a topdressing in subsequent seasons. In addition to improving water retention, organic matter will slowly release nutrients into the soil which the plant can use.

There are several requirements a grower must abide by when creating their own compost for organic production, which are described here www.omri.org/compost-standards. Applications of raw animal manure must occur at least 90 days prior to harvest for crops that do not come into contact with the soil, such as elderberries and elderflowers.

Adjusting the soil pH is possible with OMRI-listed products. Dolomitic and calcitic lime are certified in organic production to increase the soil pH, and some forms of elemental sulfur are permissible for reducing soil pH. Even soil amendments prior to planting should be recorded and included in a grower's organic systems plan.

# ORCHARD ESTABLISHMENT & MAINTENANCE

Elderberries are tolerant of a range of soil and water conditions and can produce a good crop even with suboptimal soil or water availability, however, providing adequate water, nutrition, and sunlight will maximize yield potential.

## CULTIVARS

There are numerous named elderberry cultivars available, many of which were developed in the Midwestern US and have not been extensively tested in the Pacific Northwest. Cultivars should be chosen to match a grower's needs for flower and berry traits, bush size and height, cold hardiness, or the timing of ripening.

## PLANTING STOCK

If available, growers must begin with certified organic nursery stock or propagate their own plants from certified organic plants. Growers can start with either potted plants or bare root plants from a nursery, or it is possible to propagate your own stock from either softwood or hardwood cuttings. The rate of success for elderberry propagation is relatively high even for first time growers.

Propagating elderberries for future plantings can reduce renewal costs.

# ORCHARD ESTABLISHMENT & MAINTENANCE CONTINUED

## SITE PREPARATION

To ensure adequate drainage in heavy soils, growers may opt to plant on raised beds, ridges, or berms. This technique can reduce the risk of oversaturation of the root system and may allow growers to simplify weed management or applications of organic matter, compost, or mulch.

## PRUNING

There are several pruning methods growers employ to maintain consistent yields each year, any of which should occur in late winter or very early spring when the plants are dormant. Selective removal of older canes each year is common but may be cost or labor intensive for larger plantings. Mowing the entire plant to the ground each year will reduce yields, but the cost and labor savings may be worthwhile for some growers. Heading back or shortening canes by ~1/3 is another common method which may synchronize flowering and harvest timing somewhat, but older and dead canes will still likely need to be removed yearly.

### TOOLS FOR ORGANIC GROWERS

Weed management is consistently one of the most significant challenges for organic growers. Site preparation to reduce weed pressure is critical prior to establishment; elderberries are particularly susceptible to the negative impacts of competition by weeds. In organic management, tillage and cultivation are the two primary tools for pre-plant weed management and site preparation. Deep tillage may be necessary on heavy soils, however the shallow-rooted nature of elderberries may allow shallow cultivation to be sufficient. It is common for growers to perform multiple rounds of tillage and cultivation in the seasons leading up to planting a perennial crop. Growing a pre-plant cover crop focused on fast growing and easily terminated grass species (such as oats or rye, that are locally suited) can also be effective at reducing weed pressure.

# COMMON PESTS AND DISEASES

Elderberries have relatively fewer pathogens and diseases than some other berries because they are not as widely or densely grown on the landscape. As with any production system, however, monocultures of any crop will increase habitat and persistence of diseases, insects, and other pests.

## DISEASE

Though there have not been any extreme documented disease outbreaks in elderberry in the PNW, proactive management, such as keeping alleyways mown, managing weeds, and proper nutrition and irrigation will reduce the risk of pathogens.

## INSECTS

Spotted Wing Drosophila (SWD) is a major concern for berry production across the country, including elderberries. SWD will lay eggs inside fruits before they are ripe, which makes management challenging. There are few highly effective organic insecticide sprays, but physical exclusion, regular sanitation and variety selection for thicker fruit skin on earlier maturation may provide some level of control.

# COMMON PESTS AND DISEASES CONTINUED

## BIRDS

Bird predation is a challenge for elderberry growers because they will selectively eat only the ripe berries on a cyme. Regular daily harvesting and choosing cultivars with very uniform ripening tendencies may allow a grower to overcome losses. Physical exclusion, such as nets, and deterrents, such as raptors or noise emitters, may provide some degree of control.

## DEER

Deer and elk can be a major issue for elderberries in some locations. The multi-stem nature of the plant makes tubing and caging less feasible. Deer and elk fence is a significant upfront cost; however, many growers will find it is worth the investment.

## WEEDS

Weed management is a constant challenge for all organic growers. Elderberries have a shallow root system and do not compete well against other vegetation, so weed management at planting is critical. Tillage or cultivation prior to planting and a thick layer of woodchip mulch can be effective for the first year. Some growers will place a piece of corrugated cardboard around the base of each tree under the mulch to further suppress weeds.

### TOOLS FOR ORGANIC GROWERS

Deer and birds can be challenging for elderberry growers. Deer fencing requires a significant upfront cost; however, many growers have indicated that the benefits are worth the expense. As a multi-stem plant, tree tubes for deer or elk protection are generally ineffective. If bird predation is a significant issue at harvest, several types of exclusion netting can be used to prevent birds and some insects. These nets may be designed to cover individual plants, or the entire row, and can be on a solid-set trellis or free floating. The type of netting a grower chooses will often depend on cost and infrastructure.

Weed management is a critical issue for organic growers across any production system. For perennial plants many organic growers will rely on mulch, cardboard, and landscape fabric to reduce weed pressure during and after crop establishment.

Organic and regenerative agriculture use techniques that mimic what is found in nature. Diversification can reduce the likelihood of significant detrimental pest or disease outbreaks by encouraging natural interactions that keep overabundance of a species in check. Incorporating biodiversity into or near elderberry plantings that support beneficial insects and other predators can help reduce the population of pests. Alleyway cover crops, windrows, and diverse plantings around field edges act as habitat for pollinators and other beneficial insects. Conversely, elderberries can be planted as hedgerows around existing agricultural fields to increase diversity in those systems.

# HARVEST & POSTHARVEST HANDLING

Elderberries have a very short shelf life and often will not hold on the bush for long due to predation. Efficient harvest and quickly moving berries to cold storage before processing is critical to maintain a high-quality product.

## FLOWER HARVEST

Elderflowers typically first emerge in late spring (top left); within 2-4 weeks the flowers can be in full bloom and ready for harvest (bottom left)

Elderflowers can be harvested when most of the flowers on a cyme have opened. Growers will typically harvest the entire cyme and process or preserve as soon as possible, within several hours.

## BERRY HARVEST

Berries are harvested when all the fruits on a cyme have fully ripened (important for quality and health considerations). Many growers will harvest by hand clipping the entire cyme into a container and separating the berries from the stems later; however, some growers will use strategies to knock the fruit off as they are being harvested.

## STORAGE

Elderberries are non-climacteric fruits and extremely perishable. The fruits will not ripen once they are harvested from the plant and will begin to spoil within hours if not properly processed. Fruits should be refrigerated within 4 hours, and frozen or dried within 5 days of refrigeration.

## DESTEMMING

For some growers, destemming berries is one of the most challenging and labor-intensive aspects of elderberry production. Although some commercial destemmers are available, many growers still rely on hand destemming. One common method is to freeze entire clusters and knock the berries off the cyme once they are fully frozen.

# MARKET POTENTIAL & VALUE-ADDED PROCESSING

Elderberries are often sold as a “functional food”, which is a fortifying ingredient that boosts the nutritional and health benefits of the product. The capacity to process fresh elderberries into a value-added product can significantly benefit a grower’s profit potential.

## DRIED

Freeze-drying or dehydrating berries is a common step before using the dried and/or powdered berries as an additive or supplement. Dried berries can be stored without refrigeration and shipping costs are drastically reduced compared to the fresh product. An 2024 online search showed that packaged dried elderberries are selling for $15-$35 per pound.

## SOFT DRINKS

Elderberry syrups and juices have become a common dietary supplement and marketed as an immune-boosting ingredient. Juices and syrup can also be used as a flavoring for sodas, teas, and seltzers.

## ALCOHOLS

Producers and processers are turning elderberries and elderberry mixes in wines, cordials, rum, beer, and ciders. Liqueurs are also a common use for elderflower.

## PRESERVES

Processing berries into whole fruit jams and preserves may require more thorough destemming and sorting. Elderflower can also be used as a flavoring in other types of fruit jams and preserves.

## NUTRACEUTICALS

Elderberry dietary supplements, such as extracts and concentrates, are relatively common. Although the manufacturing of these products is regulated by the US Food and Drug Administration, the products cannot make any claim to treat any disease or condition without specific review and approval by the FDA.

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