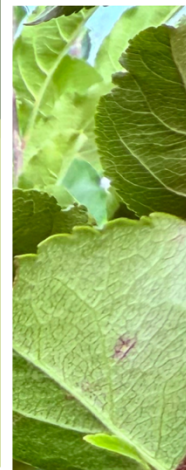




The Wood Vinegar Guru

The Orchard, Vineyard &
Berry Patch



Luna  Char

CONTENTS

WELCOME	1
GETTING STARTED WITH LUNACHAR WOOD VINEGAR	2
FARMER MATH	3
WHAT IS WOOD VINEGAR?	3
INTRODUCTION: THE ORCHARD & VINEYARD	4
FRUIT TREES (APPLE AND PEAR	5
GROWER SPOTLIGHT: BLUE MOON FARM	7
STONE FRUIT (CHERRIES, PEACHES & MORE)	7
COPPER VS. WOOD VINEGAR IN FRUIT TREES	10
BERRIES – STRAWBERRIES, BLUEBERRIES, RASPBERRIES & CANE FRUIT	11
GRAPES	13
RESEARCH SPOTLIGHT: GRAPES & WOOD VINEGAR	15
ABOUT LUNACHAR	16

WELCOME

Hello, and thank you for picking up this guide.

My name is Kevin Hoffberg. I'm the President of Regenerative Biocarbons, and I also own and work a small family farm here in the Pacific Northwest. Season after season, that farm has reminded me that good soil, careful stewardship, and a little curiosity are the real engines of productivity.

We created the LunaChar brand to bring our products — wood vinegar and biochar — directly to growers like you. These are simple, natural tools with deep roots in global agricultural practice, now refined and produced from Pacific Northwest softwoods.

Our wood vinegar and biochar are designed for ultra-low ash content, balanced pH, and maximum absorption.

They contain compounds like karrikins and cyanohydrins that help seeds sprout, roots grow deeper, and plants become stronger.

The results are healthier soil, more resilient crops, and better water retention — all while locking away carbon and contributing to a cleaner future.

This guide is meant to be practical. Inside you'll find stage-by-stage advice for vegetables, fruit, and livestock; farmer-math dosing charts; and tips you can put to work the same day.

A friendly reminder before you dig in: every garden, farm, and flock is unique. Pay attention to your conditions, take good notes, and start small as you learn what works best. Wood vinegar is powerful, but it's not a silver bullet. Used thoughtfully, it can become one of the most versatile allies in your toolkit.

We're proud to share what we've learned, and even more proud to stand alongside you in the growing movement toward regenerative agriculture — from the ground up.

GETTING STARTED WITH LUNACHAR WOOD VINEGAR

Working the land should restore it, not deplete it. Whether you garden, raise livestock, or manage a few acres of orchard or pasture, the soil beneath your feet is the foundation of everything.

LunaChar Wood Vinegar is a natural byproduct of making biochar — a smoky, amber liquid rich in organic compounds that plants, soil microbes, and even animals respond to in remarkable ways. Used in small amounts, it helps seeds germinate, roots dig deeper, leaves grow stronger, and soil life rebound. It also reduces odor, suppresses disease, and speeds composting — all without synthetic chemicals.

Each volume in this LunaChar Vinegar Series explores a different part of the farm or garden:

- **Vegetables** – quick crops that thrive on balance and consistency.
- **Fruit & Berries** – long-lived plants that benefit from steady nutrition and fungal control.
- **Flowers & Ornamentals** – bloom and color powered by gentle foliar care.
- **Critters & Compost** – bedding, manure, and soil systems that close the regenerative loop.

Though the examples come from our work in the Pacific Northwest, the principles apply anywhere growers care for soil and community alike.

How to Use This Guide

Think of LunaChar as a **multiplier of good practices**, not a replacement. Healthy soil, clean water, and good husbandry still do the heavy lifting. Wood vinegar simply tips the balance toward resilience — fewer pests, less odor, stronger plants, faster compost.

Use the dilution table on the next page as your reference point. Start light, observe results, and adjust as you go. Consistency matters more than precision.

A Note on Ratios

Our dilution rates are **guidelines**, not prescriptions. Wood vinegar is forgiving within a reasonable range — a slightly strong or weak mix won't hurt your plants.

Avoid doubling concentrations unless treating a specific issue (odor, fungus, or heavy disease pressure). When in doubt, go lighter and build from there.

Tips for Scaling Up

1 U.S. gallon = 128 fl oz = 3.78 L.

To scale, multiply the *per-gallon amount* by the number of gallons in your tank.

Example: A 10-gallon sprayer at 1:100 = 10 fl oz (≈ 300 mL) LunaChar.

- **When in doubt, start light.** You can always increase concentration if needed.
- **Mix only what you'll use that day.** Wood vinegar solutions lose potency after 24 hours.

FARMER MATH

Here are some common dilutions and applications

Dilution Ratio	Per Gallon of Water	Approx. Volume (fl oz / mL)	Common Use Context
1:500	½ teaspoon per gallon	0.1 fl oz / 3 mL	General foliar sprays for vegetables, flowers, or berries; delicate seedlings
1:400	1 teaspoon per gallon	0.17 fl oz / 5 mL	Compost activation, seed germination, sensitive transplants
1:200	2 teaspoons per gallon	0.33 fl oz / 10 mL	Disease prevention, stressed plants, bulbs, and transplants
1:100	2 tablespoons per gallon	1 fl oz / 30 mL	Soil drenches, root stimulation, fruit trees, manure treatment
1:50	4 tablespoons per gallon	2 fl oz / 60 mL	Heavy odor control (bedding, pens, compost piles)
0.1 %	½ teaspoon per gallon	0.1 fl oz / 3 mL	Cut-flower vase solution, post-harvest dips

WHAT IS WOOD VINEGAR?

When Pacific Northwest softwood goes through **pyrolysis**, two valuable materials emerge:

- The **solid carbon**, which becomes LunaChar Biochar — a stable, porous material that improves soil structure and fertility.
- The **vapors**, which condense into LunaChar Wood Vinegar — a smoky, amber liquid packed with natural organic acids, phenols, and karrikins that plants and microbes recognize as signals for growth and renewal.

Nothing is wasted. Every solid, liquid, and gas is captured and reused — a process that’s not only efficient but **carbon-negative**.

A Practice Rooted in Nature

Farmers in Japan, Korea, and China have used wood vinegar for centuries to stimulate growth, balance soil biology, and control pests.

You’ve seen its power in nature: a year after a forest fire, new green shoots carpet the ground. That’s because **karrikins**, compounds in smoke, trigger seeds to sprout and ecosystems to rebound.

LunaChar Wood Vinegar simply captures and concentrates those same compounds in a safe, practical form you can use in your garden or on your farm.

Why Fruit & Berries Thrive With It

Fruit trees and berry plants are long-term companions — they ask for consistency more than intensity.

LunaChar Wood Vinegar strengthens their foundations by feeding the rhizosphere, promoting balanced nutrition, and helping control fungal diseases like mildew and rot. The result: stronger trees, sweeter fruit, and a healthier orchard ecosystem season after season.

How It Works

Wood vinegar contains **over 200 natural compounds** that work together to restore balance and vitality:

- **Seed germination boost** – Karrikins help seeds break dormancy and sprout faster.
- **Root and growth support** – Organic acids stimulate roots and enhance nutrient uptake.
- **Natural pest deterrence** – Volatile phenols make leaves less attractive to insects and fungi.

- **Microbial balance** – Encourages beneficial soil life while suppressing pathogens.

It's not a replacement for good practice — it's a natural amplifier that helps living systems thrive.

Safe and Sustainable

Wood vinegar is **not** wood alcohol (methanol). Methanol is toxic; wood vinegar is not.

LunaChar Wood Vinegar is made exclusively from clean, untreated Pacific Northwest softwood and engineered for:

- Ultra-low ash and balanced acidity
- Consistent potency across batches
- Safety for plants, animals, and people when properly diluted

Each drop embodies the same circular principle: taking what forests offer, refining it responsibly, and returning it to the land in a form that sustains life.

INTRODUCTION: THE ORCHARD, VINEYARD & BERRY PATCH

There's something timeless about tending perennials. A row of apple trees that outlives generations. A patch of raspberries that returns faithfully each June. Grapevines twisting skyward, promising fruit that carries the flavor of place and season.

Unlike annual vegetables, these crops are an investment in years, not just one season — they ask for patience, and they reward it richly.

For home gardeners and small growers, fruit trees, berries, and grapes are often the centerpiece of the landscape. They anchor

gardens, provide shade, and create traditions around harvest time.

But they also bring their share of challenges. Shallow roots make berries vulnerable to drought. Tree canopies can harbor fungal spores that spread quickly in damp weather.

Grapes demand balance between vigorous growth and careful restraint. It's a constant dance of nurturing, watching, and adjusting.

This is where LunaChar Wood Vinegar fits in. Used with intention, it supports healthier soils, more resilient plants, and stronger

defenses against the pests and diseases that threaten long-lived crops.

Light sprays improve leaf vigor and fruit quality. Soil drenches encourage microbial balance and deeper rooting. Consistent use not only helps keep plants productive, but also reduces the need for harsher interventions.

A quick note on scope. What follows isn't a manual for large-scale orchards or

commercial vineyards. Our focus is on the backyard grower, the homesteader, and the small farm.

These are the growers most likely to tend every tree, berry patch, and grapevine by hand — and most likely to notice the subtle shifts when plants are healthy, soils are balanced, and harvests improve.

FRUIT TREES (APPLE AND PEAR)

For many gardeners, nothing says “home orchard” like an apple or pear tree. They're reliable, productive, and beloved for both fresh eating and storage. A single tree can feed a family for decades — but only if it stays healthy.

Apples and pears face their own set of challenges: scab, fire blight, powdery mildew, and a wide range of insect pests. Even a well-tended tree can see a promising crop damaged in just a few weeks.

LunaChar wood vinegar helps apples and pears stay vigorous through the entire season. From early bud break through summer growth and into harvest, it strengthens leaves, supports fruit set, and offers natural protection against pests and disease.

Establishment & Early Growth

Young trees need strong root systems and balanced growth to carry them into maturity. Stress in the first years shows up for seasons afterward.

The problem: Newly planted trees often struggle with transplant shock, poor root establishment, or weak shoot growth.

The solution: A soil drench of our wood vinegar encourages rooting, balances soil microbes, and improves early vigor.

How to use it:

- Mix 1 tablespoon per gallon.
- Apply as a soil drench at planting and repeat monthly during the first growing season.

Dormant & Early Spring Sprays

When trees are bare, they're not asleep — pests and fungal spores linger in the bark, waiting for warmer weather. A dormant spray sets the tone for the entire season.

The problem: Overwintering pests and fungal spores attack early growth, leaving trees stressed before they've even started.

The solution: LunaChar sprays (often paired with neem oil and a small amount of soap) clean bark surfaces, suppress spores, and prime the tree for healthy bud break.

How to use it:

- Mix 1–2 tablespoons LunaChar per gallon of water (plus neem and soap if desired).
- Spray bark, trunk, and branches until coated.
- Apply once before bud break; repeat every 2–4 weeks through early summer.

Active Growth & Fruit Set

As blossoms open and fruit begins to form, trees are most vulnerable to pests and nutrient stress. Supporting leaves and blossoms at this stage helps ensure a good crop.

The problem: Aphids, mites, mildew, and poor nutrient uptake reduce fruit set and stress young trees.

The solution: Foliar sprays of diluted LunaChar Wood Vinegar strengthen leaves, boost nutrient absorption, and provide natural pest deterrence.

How to use it:

- Mix 1 teaspoon–1 tablespoon per gallon of water.
- Spray every 2–4 weeks, coating tops and undersides of leaves.
- Continue through harvest — safe to spray even when fruit is ripening.

Soil & Root Feeding

Healthy roots mean healthy fruit. But compacted or depleted soil often limits water and nutrient absorption.

The problem: Trees in tired soils can't access what they need, leading to poor growth and small fruit.

The solution: Soil drenches with LunaChar Wood Vinegar improve root activity, microbial life, and nutrient uptake.

How to use it:

- Mix 2–4 tablespoons per gallon of water.
- Pour evenly around the drip line once per month during the growing season.
- For orchards with irrigation, add to drip systems 2–3 times per season.

Disease & Stress Management

Even with regular care, fruit trees can face sudden outbreaks of scab, mildew, or insect pests. Quick response matters.

The problem: Pest and disease outbreaks can reduce yield and fruit quality in a matter of weeks.

The solution: Targeted sprays of stronger LunaChar Wood Vinegar solutions — often blended with neem oil and soap — help knock down outbreaks naturally.

How to use it:

- Mix 1–2 tablespoons per gallon.
- Spray affected foliage and branches directly.
- Reapply every 7–10 days in wet conditions.
- Avoid spraying during peak bloom to protect pollinators.

Grower Tips

- **Prune for airflow:** Good canopy structure reduces disease pressure.
- **Mind your pollinators:** Plant compatible varieties nearby for cross-pollination.
- **Stay ahead of scab:** Early sprays matter most; prevention beats cure.
- **Think long-term:** Small, consistent applications add up over years in perennial systems.

What to Expect

Consistent use of LunaChar Wood Vinegar helps apples and pears stay healthier and more productive:

- Stronger root establishment.
- Leaves that hold green vigor through summer.
- More blossoms carried through to fruit set.
- Reduced scab and mildew.
- Cleaner, better-keeping fruit at harvest.

GROWER SPOTLIGHT: BLUE MOON FARM

At Blue Moon Farm in the Pacific Northwest, we care for a high-density apple orchard — about 100 trees on dwarf rootstock, trained on a trellis system with trees spaced 36 inches apart and rows 11 feet on center. Managing this style of orchard takes attention and regular pruning, but it rewards us with high yields and manageable trees.

Here's how we used LunaChar Wood Vinegar during the 2024 season:

- **Dormant Spray:** Our first application was before bud break in early spring. We coated trunks and branches thoroughly with a LunaChar Wood Vinegar mix blended with neem oil and a small amount of soap as a surfactant.
- **Seasonal Sprays:** Once petals dropped in May, we sprayed every 2–4 weeks through early summer,

coating the whole canopy and even the undersides of leaves.

- **Root Feeding:** Twice during the season, we added LunaChar Wood Vinegar to drip irrigation alongside calcium nitrate. This supported strong vegetative growth and fruit development.
- **Results:** The trees stayed remarkably clean — with no noticeable pest or disease damage — and put on so much growth that we had to summer prune aggressively to manage the canopy.

👉 Our experience aligns with the research, suggesting that consistent, low-dose applications of LunaChar Wood Vinegar keep trees healthier, stronger, and more resilient throughout the growing season.

STONE FRUIT (CHERRIES, PEACHES & MORE)

Cherries, peaches, and other stone fruits bring a special joy to the garden. A ripe cherry fresh from the tree or a sun-warmed peach eaten in the orchard is as good as it gets. But these fruits are also some of the most challenging to grow. Diseases like peach leaf curl and brown rot, along with unpredictable weather, can wipe out blossoms or spoil fruit before harvest.

While direct research on wood vinegar use in stone fruit is still limited, studies on apples, pears, grapes, and even other vegetables show consistent benefits. Many growers are now experimenting with LunaChar Wood Vinegar as part of their

orchard care — and the early signs are very promising.

Establishment & Early Growth

Young stone fruit trees need strong roots and balanced vegetative growth to set the foundation for years of productivity. Stress during the first seasons lingers for years.

The problem: Transplant shock, shallow rooting, or poor microbial balance weaken young trees, leaving them prone to early leaf curl or stunted shoots.

The solution: Soil drenches of LunaChar Wood Vinegar encourage stronger rooting,

stimulate microbial activity, and support even shoot development.

How to use it:

- Mix 1 tablespoon per gallon of water.
- Apply as a soil drench at planting and repeat monthly during the first growing season.

Dormant & Early Season Sprays

Stone fruits, like apples and pears, benefit from starting the season clean.

Overwintering fungi and bacteria often linger on bark and buds, ready to strike as growth begins.

The problem: Peach leaf curl and other fungal diseases take hold as buds swell, setting back the tree for the whole season.

The solution: Dormant sprays of LunaChar Wood Vinegar help suppress overwintering disease pressure and support healthy bud break.

How to use it:

- Mix 1 tablespoon LunaChar Wood Vinegar, 2 tablespoons neem oil, and ½ teaspoon mild soap per gallon of water.
- Thoroughly spray trunks, branches, and buds before bud break.

Fruit Set & Early Growth

Once blossoms drop, trees redirect their energy into setting fruit and growing leaves. Stress at this stage can significantly reduce yields.

The problem: Fungal pressure (like brown rot) or nutrient stress reduces fruit set and weakens young shoots.

The solution: Foliar sprays of LunaChar Wood Vinegar promote healthy leaves and fruitlets while discouraging pathogens.

How to use it:

- Mix 1 teaspoon per gallon of water.
- Spray every 2–3 weeks from petal drop until fruit begins to size up.

Disease & Stress Management

Stone fruits are especially prone to sudden problems like peach leaf curl in spring or brown rot as fruit ripens. These diseases can spread quickly, ruining leaves, blossoms, and fruit in a matter of days.

The problem: Leaf curl, brown rot, and bacterial infections are common in cherries, peaches, and plums, often flaring up in damp or humid weather.

The solution: Stronger sprays of LunaChar Wood Vinegar — often blended with neem oil and a mild soap — help suppress outbreaks naturally without leaving harsh residues.

How to use it:

- Mix 1–2 tablespoons LunaChar Wood Vinegar per gallon of water.
- Spray affected leaves, branches, and fruit directly.
- Reapply every 7–10 days during wet conditions.
- Avoid spraying during peak bloom to protect pollinators.

What the research says: Laboratory trials show LunaChar suppresses fungi responsible for **brown rot and leaf curl**, and apple trials confirm reduced spore counts of *Alternaria*.

In cucumbers and tomatoes, LunaChar Wood Vinegar sprays matched copper fungicides in reducing *Rhizoctonia* and *Sclerotinia* pressure. Orchardists testing it on peaches and cherries report visibly healthier leaves and fewer brown rot infections.

Mid-Season Fruit Development

As peaches, cherries, or plums size up, they're especially vulnerable to disease and environmental stress.

The problem: Brown rot, bacterial infections, or uneven nutrient uptake can scar or shrink fruit.

The solution: Regular sprays of LunaChar Wood Vinegar promote vigorous leaf function, nutrient uptake, and improved fruit quality — firmer flesh, better color, and higher sugars.

How to use it:

- Mix 1–2 teaspoons per gallon of water.
- Spray foliage and developing fruit every 2–3 weeks through summer.

Pre-Harvest Support

As fruit approaches ripening, maintaining health right up to picking makes the difference between perfect fruit and disappointing losses.

The problem: Late-season outbreaks of brown rot or mildew can ruin ripe fruit overnight.

The solution: LunaChar Wood Vinegar is safe to use up to harvest, helping protect fruit without chemical residues.

How to use it:

- Mix 1 teaspoon per gallon of water.
- Spray leaves and fruit every 2 weeks until harvest.

Grower Tips

Stone fruits reward consistency and careful observation. A few simple practices, paired with LunaChar Wood Vinegar, go a long way toward keeping trees healthy and harvests abundant:

- Prune carefully: Good airflow reduces brown rot and mildew risk.
- Spray early: Prevention is key; it's easier to block disease than to cure it.
- Pair with copper: Use copper in dormant season for high-pressure years, then LunaChar through the growing season.
- Mulch and feed: Healthy soil buffers stress and helps trees carry bigger crops.

What to Expect

Growers using LunaChar Wood Vinegar with stone fruits can expect noticeable improvements:

- Cleaner leaves with fewer curl and mildew infections.
- Stronger, greener canopy growth through summer.
- Reduced brown rot damage, especially near harvest.
- Fruit that sizes up better, colors more evenly, and keeps longer after picking.

COPPER VS. WOOD VINEGAR IN FRUIT TREES

Copper and sulfur sprays are the backbone of orchard disease management. From apple scab to peach leaf curl, they've been used for more than a century. But LunaChar Wood Vinegar offers an effective, lower-toxicity complement — one that supports plant health while reducing chemical load.

Copper's track record:

- *Apples & Pears:* Copper sprays before bud break help suppress scab and fire blight. In high-pressure years, this can mean the difference between a clean crop and major losses.
- *Peaches & Nectarines:* Copper applied in fall or early spring is the standard for peach leaf curl, with excellent preventive control.
- *Cherries & Stone Fruit:* Sulfur and copper combinations are still widely used to check powdery mildew and bacterial canker.

Where wood vinegar fits:

- Trials show wood vinegar can match copper in some fungal systems: 0.125–0.5% sprays reduced *Rhizoctonia* and *Sclerotinia* by up to 87%.
- Apple trials report reduced *Alternaria* blotch and lower fungal spore counts on treated foliage.
- Unlike copper, LunaChar Wood Vinegar stimulates chlorophyll production, root vigor, and microbial balance, helping trees bounce back from stress while controlling pathogens.

Integrated approach:

- Copper is still valuable in dormant-season programs and for high-pressure bacterial diseases like fire blight.
- LunaChar Wood Vinegar is best deployed during active growth — foliar sprays and soil drenches that strengthen plant defenses, reduce fungal pressure, and improve fruit quality.
- Together, they form a complementary program: copper for critical disease windows, LunaChar Wood Vinegar for season-long resilience.

👉 The takeaway: copper isn't going away — but LunaChar Wood Vinegar gives growers a sustainable way to reduce copper reliance, protect soil health, and keep trees thriving through the season.

BERRIES – STRAWBERRIES, BLUEBERRIES, RASPBERRIES & CANE FRUIT

Berries are the jewels of the garden. A handful of sun-warmed raspberries, a bowl of strawberries eaten on the porch, blueberries tucked into pancakes — these are the flavors that make summer memorable.

But anyone who grows berries knows they can be demanding. Shallow roots make them vulnerable to drought. Fungal diseases love the dense canopy. And harvest depends on keeping plants healthy and productive through long growing seasons.

This is where LunaChar Wood Vinegar shines. Applied consistently, it supports vigorous growth, helps suppress fungal and bacterial pressure, improves fruit set and sweetness, and even extends shelf life after harvest.

Establishment & Early Growth

Berry plants need strong roots and shoots in their first year to set the stage for many years of productivity. Stress at planting time can mean weak stands and reduced long-term yield.

The problem: Stress at planting time often results in weak stands and reduced long-term yields.

The solution: A light soil drench of our wood vinegar encourages root growth, microbial activity, and plant resilience from the very beginning.

How to use it:

- Mix 1 tablespoon per gallon.
- Apply as a soil drench around the root zone at planting.
- Repeat monthly during the first growing season.

Vegetative Growth & Canopy Health

Once established, berries rely on strong, healthy leaves to generate energy for flowering and fruit. A weak canopy means smaller harvests, while dense, unbalanced growth invites disease.

The problem: Insufficient canopy growth or leaf disease reduces photosynthesis and yield potential.

The solution: Regular foliar sprays of LunaChar Wood Vinegar promote chlorophyll production and improve resistance to stress and pathogens.

How to use it:

- Mix 1 teaspoon per gallon.
- Spray foliage every 2–3 weeks during active growth.
- Be sure to coat undersides of leaves, where fungal spores often lurk.

Flowering & Fruit Development

The real reward in berries comes when blossoms turn to fruit. At this stage, energy demands are high, and stress shows up as fewer berries, uneven ripening, or bland flavor.

The problem: Plants under stress during flowering or fruit fill produce lower yields and poor-quality fruit.

The solution: Continued foliar sprays keep plants vigorous and resilient, while soil drenches support nutrient uptake. Research shows wood vinegar applications improve sugar content, firmness, and color in berries.

How to use it:

- Mix 1 teaspoon per gallon for foliar sprays every 2 weeks.
- Apply a soil drench at 1 tablespoon per gallon monthly for better flavor and storability.

Disease & Stress Management

Berries are magnets for fungal diseases like gray mold, anthracnose, and powdery mildew. They're also a target for insect pests such as aphids and mites.

The problem: Left unchecked, disease and pest pressure can defoliate plants, rot fruit, and wipe out yield.

The solution: Stronger foliar sprays of LunaChar Wood Vinegar (often paired with neem oil and soap) act as a natural deterrent, suppressing pathogens and pests without synthetic chemicals.

How to use it:

- Mix 1–2 tablespoons per gallon.
- Apply directly to affected foliage every 7–10 days in wet conditions.
- Avoid spraying during peak bloom to protect pollinators.

Grower Tips

Berry crops reward patience and steady care. A few practices make all the difference:

- Establish plants with soil drenches plus compost or biochar for long-term vigor.
- Mulch heavily to conserve water and suppress weeds.
- Prune raspberries and cane fruit regularly to maintain airflow and reduce disease.
- Stay ahead of gray mold by spraying after rain events.
- Harvest frequently — removing ripe fruit reduces pest attraction and disease spread.

What to Expect

With consistent use of LunaChar Wood Vinegar, berry crops respond in clear and measurable ways:

- Stronger root systems and healthier establishment in the first year
- More vigorous canopies with greener, more resilient leaves
- Sweeter, firmer, and better-colored fruit
- Reduced fungal outbreaks such as gray mold and anthracnose
- Improved post-harvest shelf life

Research supports these findings:

strawberries treated with wood vinegar exhibited higher sugar content and firmness, **raspberries** showed fewer fungal infections, and **blueberries** demonstrated improved root vigor and nutrient uptake.

Shelf Life & Sweetness

Research on strawberries and raspberries shows that treated fruit doesn't just look better on the plant — it holds quality longer once picked.

- **Sweeter flavor:** Studies found higher sugar content (°Brix) in treated strawberries, translating to better taste.
- **Firmer fruit:** Wood vinegar applications improved firmness, meaning less bruising in storage.
- **Longer shelf life:** Raspberries treated during fruit fill showed lower rates of gray mold and stayed marketable longer.
- **Better color and appeal:** In trials with strawberries and cane fruit, berries developed deeper color and more uniform ripening.

For home gardeners, that means berries that taste sweeter and last longer in the fridge. For small farmers, it means less loss between field and market — and happier customers at the stand.

GRAPES

Whether it's a backyard trellis of table grapes or a few rows of wine grapes, there's nothing quite like harvesting your own clusters.

Grapes bring joy to gardeners and vintners alike — the anticipation of ripening fruit, the shade of leafy canopies, and the reward of sweet, complex flavors.

But anyone who grows grapes knows they can be finicky. They're prone to fungal diseases, sensitive to nutrition, and easily stressed by weather. A promising crop can be lost to mildew or shriveled clusters if vines don't get the support they need.

LunaChar Wood Vinegar provides a natural approach to strengthening grapevines, protecting against disease, and promoting balanced ripening — without relying on harsh sprays.

Establishment & Early Growth

When young vines are first planted, the goal is to establish deep roots and steady shoot growth. Weak starts set back productivity for years.

- **The problem:** Newly planted vines often suffer from transplant stress, poor rooting, or slow canopy growth.
- **The solution:** A soil drench of our wood vinegar stimulates root vigor, microbial balance, and strong early shoots.

How to use it:

- Mix 1 tablespoon per gallon.
- Apply at planting and repeat monthly during the first growing season.

Early Season Vine Health

As vines wake from winter dormancy, they burst into rapid growth. This early stage sets the framework for the season's canopy and clusters.

The problem: Weak or nutrient-deficient shoots can mean smaller leaves, weaker canopies, and fewer fruiting sites.

The solution: A gentle foliar spray with LunaChar Wood Vinegar promotes stronger early growth and improves nutrient absorption, laying the foundation for a healthy season.

How to use it:

- Mix ½–1 teaspoon per gallon of water.
- Spray young shoots and leaves every 2–3 weeks during early growth.

Flowering & Fruit Set

Grapevine bloom is a delicate process. Strong flowers and steady pollination determine how many clusters develop and how many berries hold.

The problem: Stress or disease at bloom can reduce fruit set, leaving fewer, looser clusters.

The solution: Regular LunaChar sprays support flowering, encourage strong berry set, and provide a natural line of defense against early mildew.

How to use it:

- Mix 1 teaspoon per gallon of water.
- Spray leaves and young clusters every 2 weeks through berry set.

Disease & Stress Management

Grey mold (*Botrytis*) and powdery mildew are the bane of grape growers, especially in damp springs or humid summers. Left unchecked, these fungi can wipe out entire clusters.

- **The problem:** Fungal outbreaks reduce yields and ruin fruit quality.
- **The solution:** LunaChar sprays create an unfavorable environment for fungal spores while boosting the plant's natural resistance, offering organic growers an alternative to copper or sulfur sprays.

How to use it:

- Mix 2 teaspoons per gallon.
- Spray leaves, stems, and clusters every 10–14 days, especially in wet weather.
- Safe to use right up to harvest.

Fruit Maturation

As berries ripen, grapes need balance: enough stress to concentrate flavor, but enough health to finish strong.

The problem: Late-season disease pressure or nutrient imbalances can mean watery fruit, uneven ripening, or smaller harvests.

The solution: Continued use of LunaChar keeps vines resilient, supports nutrient flow, and helps clusters ripen evenly without sacrificing quality.

How to use it:

- Mix ½–1 teaspoon per gallon of water.
- Spray every 2–3 weeks until harvest.

Grower Tips

Grapes are sensitive crops, but attentive care paired with LunaChar Wood Vinegar pays off in healthier vines and cleaner clusters. A few reminders:

- Train and prune for airflow — it's your best defense against mildew.
- Pair LunaChar sprays with organic sulfur if disease pressure is high.
- Mulch under vines to conserve water and moderate soil temperature.
- Keep sprays light but consistent; grapes respond to steady support.

What to Expect

With consistent use of LunaChar Wood Vinegar, grapevines respond in ways you'll notice:

- Stronger, healthier canopy growth.
- More reliable fruit set with fuller clusters.
- Reduced powdery mildew and *Botrytis* outbreaks.
- Clusters that ripen more evenly with improved sweetness and firmness.

RESEARCH SPOTLIGHT: GRAPES & WOOD VINEGAR

New research confirms what growers have long observed: wood vinegar (pyroligneous acid) helps **protect grapevines from disease** and **enhance fruit quality**.

Botrytis (Gray Mold) Control:

- In controlled trials on *Red Globe* grapes, wood vinegar sprays diluted 1:400–1:600 cut **disease incidence and severity** of gray mold.
- Treated berries showed less oxidative stress and higher activity of natural defense enzymes, making vines more resilient under pressure.

Yield & Quality Gains:

- A two-year field study reported that **4% wood vinegar applied every 21 days** boosted grape yields by **up to 37%**.
- Fruit chemistry improved as well: sugars (°Brix), phenolics, carotenoids, and flavonoids all rose by about **25–35%**, enhancing both flavor and nutritional value.

Practical Integration:

- Sulfur remains essential for powdery mildew, but wood vinegar provides a safe, season-long complement.
- It fits organically, can be applied up to harvest, and helps reduce reliance on harsher sprays.

👉 **The takeaway:** Grapes respond powerfully to wood vinegar — with stronger disease resistance, higher yields, and better-quality clusters.

ABOUT LUNACHAR

LunaChar is made in the Pacific Northwest by **Regenerative Biocarbons**, a division of **Regenerative Industrial, Inc.**, dedicated to restoring the balance between forest, farm, and community.

We turn local sawmill waste into carbon-negative products — biochar and wood vinegar — that help growers close the loop between what they take from the land and what they return to it.

Whether you grow vegetables, flowers, fruit trees, or livestock feed, LunaChar gives you a simple way to care for your soil and your future.

<https://lunachar.com>

© 2025 Regenerative Industrial, Inc. All rights reserved.

LunaChar™ and Regenerative Biocarbons™ are trademarks of Regenerative Industrial, Inc.

No part of this publication may be reproduced or distributed without written permission, except for brief quotations or educational use with attribution.