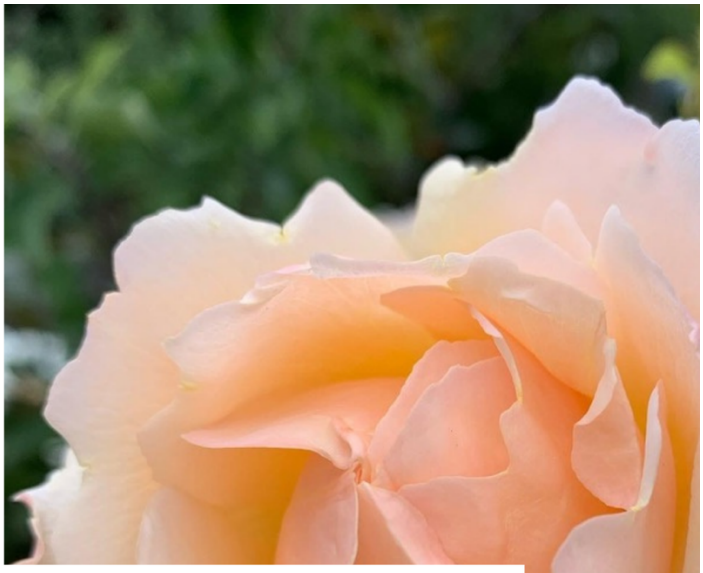

The Wood Vinegar Guru

Flowers: Annuals, Perennials & Ornamentals

Luna Char

CONTENTS

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 Flowers Respond So Well

Flowers tell the truth about soil health. They bloom best in balanced environments where roots can breathe and nutrients flow steadily.

LunaChar Wood Vinegar brings that balance back. It supports chlorophyll production, reduces disease pressure, and extends bloom life naturally — keeping ornamentals, perennials, and bedding plants vigorous without heavy feeding or synthetic sprays.

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.

FLOWERS: ANNUALS, PERENNIALS & ORNAMENTALS

From backyard beds to bouquets on the table, flowers are the heartbeat of many gardens. They bring color, fragrance, and joy — whether you're tending a border of perennials, sowing annuals for quick blooms, or growing cut flowers for arrangements.

Unlike fruit trees or food crops, flowers are grown primarily for their form and fragrance — but that doesn't mean they're any less demanding. From germination to bloom, they can be just as prone to weak starts, pest pressure, or fungal disease.

Because this book is written from a Pacific Northwest perspective, we pay special attention to our local soils and growing conditions.

West of the Cascades, heavy rainfall leaches nutrients, leaving soils naturally acidic (often with a pH of 4.5–6.0). That means many classic flowers — roses, mums, zinnias, sweet peas, bachelor buttons, daisies, rhododendrons — thrive here.

East of the mountains, soils are often sweeter (alkaline), and in those conditions wood vinegar can help adjust pH slightly downward.

In either case, LunaChar Wood Vinegar is not used as a primary pH corrector.

Instead, at low doses (fractions of a teaspoon per gallon — farmer math: 1 part in 500) it acts as a gentle stimulant that improves germination, strengthens growth, and suppresses disease in crops already suited to their soil.

To make this practical, we've organized flowers into three main categories based on how they enter the garden:

- **Seeds** — annuals and perennials started directly in soil or trays.
- **Bulbs** — tulips, daffodils, lilies, and others that store energy underground and bloom year after year.
- **Transplants & Ornamentals** — roses, rhododendrons, mums, and other long-lived plants that require special care but reward us with structure, fragrance, and showy blooms.

This structure lets us highlight the unique challenges of each pathway — germination and damping-off for seeds, establishment and rot prevention for bulbs, disease and pruning for ornamentals — while still keeping the flow consistent.

Why LunaChar Wood Vinegar helps:

- Provides a natural boost at every stage.
- Signals seeds to germinate more quickly and evenly, stimulates root and bulb vigor,
- Strengthens stems and foliage, suppresses common diseases like damping-off, powdery mildew, and rot, and
- Extends bloom life and vase quality after harvest.

In short, it gives you sturdier plants, longer-lasting flowers, and more reliable performance from garden beds to bouquets.

FLOWERS FROM SEEDS (ANNUALS & PERENNIALS)

Starting flowers from seed is one of the most satisfying parts of gardening. A tray of tiny seedlings, a row of sprouting sweet peas, or a summer bed bursting with zinnias all begin the same way: a packet of seeds, a bit of soil, and some care.

But as simple as it looks, flowers grown from seed can be tricky. Germination can be erratic, seedlings fragile, and blooms short-lived without steady support.

LunaChar Wood Vinegar provides a natural lift at each stage. From the very first mist that helps seeds break dormancy, to foliar sprays that strengthen stems and suppress fungal pressure, it improves the odds of success while keeping your garden safe for pollinators, people, and pets.

Germination & Establishment

The joy of flowers starts with strong, even germination. Yet small seeds often struggle — some sprout unevenly, others rot in wet soil, and still others damp off before they take hold.

The problem: This is a critical time in a plant's development. The faster a plan germinates and becomes a robust seedling, the higher the success rate. Weak or uneven germination leaves bare patches, wasted seed, and late transplants that never catch up.

The solution: A low-dose mist of LunaChar Wood Vinegar (about ½ teaspoon per gallon) signals seeds to germinate more evenly and helps suppress soilborne fungi like damping-off.

How to use it:

- Mist seed trays, paper towels, or seed rows lightly after sowing.
- For soil sowing, apply once after planting; water as usual afterward.
- For delicate seeds like snapdragons or pansies, mist only until moist, not soaked.

Vegetative Growth & Stem Strength

After germination, flowers move quickly into leafy growth. This is where they build the engine that powers blooming: sturdy stems, abundant leaves, and a canopy able to support blossoms.

The problem: Weak vegetative growth leaves plants vulnerable. Stems grow spindly, leaves lack chlorophyll, and blooms are fewer and shorter-lived.

The solution: Foliar sprays of LunaChar Wood Vinegar (1 teaspoon per gallon) stimulate chlorophyll production, strengthen cell walls, and improve nutrient uptake, producing stronger stems and greener foliage.

How to use it:

- Spray every 2–3 weeks during active growth.
- Coat both tops and undersides of leaves, where spores and pests often start.
- For cut-flower crops, continue sprays until buds begin to show color.

Flowering & Bloom Development

The real payoff comes when buds swell and blooms open. At this stage, plants must balance high energy demand with resilience against stress.

The problem: Stress during bloom — heat, drought, or fungal disease — cuts bloom life short and reduces flower count.

The solution: Regular foliar sprays of LunaChar Wood Vinegar help flowers hold blossoms longer, deepen color, and extend vase life post-harvest.

How to use it:

- Mix 1 teaspoon per gallon.
- Spray foliage and buds every 2–3 weeks through bloom.
- For cut flowers, dip stems in a 0.1% solution (about ½ teaspoon per gallon) after harvest to extend vase life.

Sidebar: Cut Flower Longevity

For anyone growing flowers for arrangements, vase life is just as important as bloom size. Research shows that wood vinegar at very low doses can extend post-harvest freshness by slowing bacterial growth in the vase and helping stems stay hydrated.

- **Dosing:** A 0.1% solution (about ½ teaspoon per gallon) is enough.
- **How to use it:** After cutting, place stems in clean water with LunaChar Wood Vinegar added. Replace the solution every 2–3 days.
- **Results:** Expect flowers to stay fresher and more vibrant for several extra days compared to plain water.

This is especially useful for zinnias, sweet peas, and other flowers that tend to fade quickly indoors.

Disease & Stress Management

Flowers may look delicate, but their real challenge is surviving the stresses of the season: fungal spores that lurk in the canopy, insect pests that chew through leaves, and the simple fact that blooms are the most energy-intensive stage of a plant's life.

The problem: Common issues include damping-off in seedlings, powdery mildew

on foliage, and botrytis (gray mold) on petals. Heat or drought stress can also shorten bloom life dramatically.

The solution: Regular foliar sprays of LunaChar Wood Vinegar at low doses (½–1 teaspoon per gallon) suppress fungal pathogens, discourage insect pests, and strengthen plant tissues so flowers can better withstand environmental swings.

For roses and other high-maintenance ornamentals, stronger sprays (1–2 teaspoons per gallon) paired with neem oil and soap offer season-long defense without harsh chemicals.

How to use it:

- For general flowers: Mix ½–1 teaspoon per gallon and spray foliage every 2–3 weeks.
- For roses or heavy disease pressure: Mix 1–2 teaspoons per gallon, blend with neem oil and mild soap, and spray every 7–10 days in humid or rainy conditions.
- Always spray early morning or evening to avoid leaf burn.
- Safe to continue through bloom — won't harm pollinators when applied responsibly.

Grower Tips

Flowers from seed reward consistency more than intensity. A few simple practices make all the difference:

- **Succession sowing:** Start new batches every 2–3 weeks for a longer season of blooms.
- **Thin early:** Crowded seedlings stretch thin; cull extras to give each plant room.
- **Airflow matters:** Space plants so foliage dries quickly after rain, reducing disease pressure.
- **Pair with biochar:** Adding biochar at planting improves soil texture and microbial life, giving flowers a stronger base.

What to Expect

With steady use of LunaChar Wood Vinegar, flower seed growers see reliable, measurable results:

- More even germination and stronger seedlings.
- Stems that grow straighter and sturdier.
- Blooms with deeper color and longer life, both on the plant and in the vase.
- Reduced disease pressure, especially from damping-off and powdery mildew.

FLOWERS FROM BULBS

Tulips in spring, lilies in summer, dahlias in fall — bulbs are some of the most dependable sources of color in the garden.

Unlike flowers from seed, the energy for that first burst of growth is already stored underground.

The gardener's job is to protect that investment: keep bulbs from rotting, help shoots break through cleanly, and support healthy foliage so the bulb can recharge for next year.

LunaChar Wood Vinegar fits naturally into this cycle. At low doses, it helps bulbs resist rot in damp soils, strengthens stems and leaves, and suppresses common fungal pressures that shorten bloom life.

Because bulbs spend much of the year underground, small, well-timed applications can make a big difference.

Establishment & Early Growth

When bulbs break dormancy, the first shoots are tender and highly vulnerable to rot and disease.

The problem: Cool, wet soils often lead to fungal infections like fusarium or pythium, causing bulbs to rot before they emerge.

The solution: A light soil drench of LunaChar Wood Vinegar supports microbial balance, suppresses harmful fungi, and encourages stronger root initiation.

How to use it:

- Mix 1 teaspoon per gallon of water.
- Apply as a soil drench at planting and again as shoots first emerge.
- In heavy soils, use raised beds or amend with compost and biochar for extra drainage.

Vegetative Growth & Stem Strength

Once foliage emerges, the bulb needs to build strong stems and wide leaves to fuel bloom.

The problem: Weak stems topple in wind or rain; poor leaf development limits photosynthesis and weakens blooms.

The solution: Foliar sprays of LunaChar boost chlorophyll production and strengthen stem tissue.

How to use it:

- Mix 1 teaspoon per gallon.
- Spray foliage every 2–3 weeks until buds appear.
- Coat undersides of leaves where mildew often starts.

Flowering & Bloom Development

Bulbs are built for show, but weather or disease can cut that show short.

The problem: Powdery mildew, botrytis, or nutrient stress reduce bloom size, color, and longevity.

The solution: Continued low-dose sprays keep foliage clean, extend bloom life, and improve flower color and vibrancy.

How to use it:

- Mix 1 teaspoon per gallon.
- Spray buds and foliage every 2–3 weeks through bloom.
- For cut flowers (tulips, lilies, gladiolus), dip stems in a 0.1% solution after harvest for longer vase life.

Disease & Stress Management

Bulbs spend months underground where conditions are hard to control.

The problem: Soilborne fungi linger year to year, and bulbs stored improperly may sprout weak or diseased.

The solution: Use LunaChar drenches at planting and foliar sprays during growth to reduce pressure, while pairing with crop rotation and clean storage practices.

How to use it:

- Drench stored bulbs at planting (1 teaspoon per gallon).
- Repeat every 4–6 weeks in wet weather.
- Always cure and store bulbs in a cool, dry place before replanting.

Research Note: Bulbs & Disease Suppression

Though direct studies on tulips or daffodils are limited, research on related crops points to clear benefits:

- **Fusarium control:** Trials in onions and garlic — both bulb crops — showed that wood vinegar applications reduced Fusarium infection and improved bulb weight and storability.
- **Botrytis suppression:** Laboratory studies confirm that wood vinegar inhibits Botrytis cinerea, the same fungus that often causes bulb rots during storage.
- **Stronger starts:** Work on ornamentals shows that bulbs treated with dilute wood vinegar sprouted more vigorously, with higher shoot and root weights compared to untreated controls.

👉 Together, these findings suggest that dipping or drenching bulbs with low-dose LunaChar Wood Vinegar before storage or planting helps guard against rot and sets the stage for stronger blooms next season.

Grower Tips

- Rotate beds: Don't replant bulbs in the same spot for at least 3–4 years.
- Deadhead promptly: Removing spent blooms helps the bulb recharge for next year.
- Feed the bulb: Healthy foliage after bloom is key — keep spraying until leaves naturally yellow.
- Pair with biochar: Improves drainage and microbial diversity in bulb beds.

What to Expect

With LunaChar Wood Vinegar, bulbs show stronger emergence, cleaner foliage, and longer-lasting blooms:

- Reduced bulb rot and damping-off in wet soils.
- Straighter stems that hold flowers upright.
- Bigger, more vibrant blooms with extended vase life.
- Stronger bulbs that recharge better for next year's display.

Sidebar: Storing Bulbs Right

Healthy blooms next season start with how you handle bulbs this season. After flowering, bulbs need time to recharge, then proper storage to keep them disease-free until planting.

Key steps:

- **Cure before storage:** After digging, brush off soil and let bulbs dry for 1–2 weeks in a shaded, well-ventilated spot.
- **Check for damage:** Discard or separate any soft, moldy, or wounded bulbs.
- **Storage conditions:** Keep in a cool (40–55 °F), dry, dark location with good airflow. Mesh bags or slatted crates work well.
- **Use LunaChar for protection:** Before storage, dip bulbs in a light solution (½ teaspoon per gallon of water). This helps suppress lingering fungal spores and discourages storage rot.
- **Monitor monthly:** Remove any bulbs that show signs of softness or mold to prevent spread.

👉 A few minutes of care at the end of the season ensures healthier, more vigorous bulbs when you replant.

FLOWERS FROM TRANSPLANTS & ORNAMENTALS

Not every flower starts from seed. Many gardeners prefer the head start of transplants from a nursery flat, potted ornamentals from the garden center, or established shrubs like rhododendrons and roses.

These plants arrive with roots, shoots, and often buds already formed — but they also arrive with baggage. Transplant shock, compacted roots, and exposure to new soils can leave them vulnerable just when they should be surging ahead.

Among ornamentals, **roses stand out as both the most admired and the most demanding**. Black spot, mildew, and insect pressure mean they rarely thrive without help. Rhododendrons and other woody ornamentals also have their quirks, especially in the acidic soils of the Pacific Northwest.

LunaChar Wood Vinegar offers a gentle way to help all ornamentals adjust and thrive. Whether used as a soil drench or foliar spray, it supports root recovery, balances microbial activity, and strengthens foliage.

And for roses in particular, it provides season-long defense while keeping pollinators and people safe.

Establishment & Root Recovery

The problem: Newly transplanted flowers often stall after planting. Roots may be bound from containers, shocked by the move, or slow to explore unfamiliar soil. This lag weakens top growth and leaves plants open to pests and disease.

The solution: Soil drenches of LunaChar Wood Vinegar stimulate fresh root growth and encourage microbial partners in the soil. By reducing transplant stress and boosting vigor below ground, plants are better able to push new shoots and establish quickly.

How to use it:

- Mix 1 tablespoon per gallon of water.
- Apply as a soil drench around the root zone at planting.
- Repeat every 2–3 weeks through the first two months after transplanting.
- For container ornamentals, use the same mix when watering to keep roots active.

Establishment & Early Growth

When ornamentals first hit the ground, their success depends on how quickly they adapt to new soil. A transplant with stressed roots or compacted soil can stall, leaving foliage yellow and blooms delayed.

The problem: Transplant shock, poor root recovery, and weak nutrient uptake slow establishment. Plants may wilt, lose leaves, or simply sit without putting on growth.

The solution: Soil drenches of LunaChar Wood Vinegar encourage root repair, stimulate microbial allies, and reduce early stress. By supporting faster root-to-soil contact and steadier nutrient flow, ornamentals regain momentum more quickly.

How to use it:

- Mix 1 tablespoon per gallon of water.
- Apply as a soil drench at planting and repeat monthly through the first season.
- For container ornamentals (like patio roses or potted mums), apply every 3–4 weeks to keep roots active.

Vegetative Growth & Canopy Health

Once ornamentals are established, the focus shifts to building a healthy canopy. Strong stems, lush leaves, and balanced growth are the foundation for extended flowering and overall plant resilience.

The problem: Without support, ornamentals can develop spindly stems, pale foliage, or unbalanced growth that leaves them prone to pests and diseases. In roses, weak canopies often invite aphids, mites, and mildew, which exploit stressed tissues.

The solution: Regular foliar sprays of LunaChar Wood Vinegar stimulate chlorophyll production, strengthen cell walls, and enhance nutrient uptake. Plants not only look greener and fuller but also maintain stronger resistance to common stressors.

How to use it:

- Mix 1 teaspoon per gallon of water.
- Spray foliage every 2–3 weeks during the growing season.
- For roses, coat both upper and lower leaf surfaces to stay ahead of mildew and black spot.
- In humid climates, increase spray frequency to every 10–14 days for added protection.

Sidebar: Preventive vs. Curative Sprays

Not all applications serve the same purpose. LunaChar Wood Vinegar can be used in two complementary ways:

Preventive

Keep problems from gaining a foothold.

- Use low doses (½–1 tsp per gallon) every 2–3 weeks.
- Start early in the season, before disease or pest pressure is visible.
- Works best for damping-off, powdery mildew suppression, and general stress resistance.

Curative

Respond quickly when problems appear.

- Increase to **1–2 tsp per gallon** at first sign of disease or pest outbreak.
- Apply weekly (every 7–10 days) until symptoms subside.
- Blend with neem oil and mild soap for tougher fungal or insect pressure.

👉 Most gardeners find that a steady preventive program greatly reduces the need for curative sprays later in the season.

Disease & Stress Management

Transplanted ornamentals face a long season in the ground, which means more time for fungal spores, pests, and stress to take their toll.

Left unchecked, these pressures can weaken plants, shorten bloom time, and reduce overall garden performance.

The problem: Common issues include powdery mildew on foliage, botrytis (gray mold) on blooms, and aphids or mites colonizing tender growth. High humidity or poor airflow only makes these problems worse.

The solution: Regular LunaChar Wood Vinegar sprays strengthen plant tissues, discourage fungal spore germination, and make foliage less hospitable to pests. Low-dose preventive sprays (½–1 teaspoon per gallon) every 2–3 weeks keep most ornamentals healthy through the season. When outbreaks do occur, stronger curative sprays (1–2 teaspoons per gallon) — often paired with neem oil and mild soap — help stop problems from spreading.

SPECIAL FOCUS: ROSES

Roses require more attention than most ornamentals. They are especially prone to black spot, powdery mildew, and rust, which can defoliate plants and cut bloom cycles short.

Preventive sprays of LunaChar (½–1 teaspoon per gallon) every 10–14 days, starting early in the season, keep foliage cleaner and delay the onset of disease.

If symptoms appear, switch to curative-strength sprays (1–2 teaspoons per gallon) blended with neem oil and soap, applied weekly until pressure subsides.

Combined with good cultural practices — pruning for airflow and removing infected leaves — this approach gives roses a real chance to thrive without reliance on harsh fungicides.

How to use it:

- For ornamentals in general: mix ½–1 tsp per gallon, spray every 2–3 weeks.
- For roses or heavy disease pressure: mix 1–2 tsp per gallon, pair with neem + mild soap, spray every 7–10 days.
- Always spray in early morning or evening to avoid leaf burn.
- Continue through bloom — safe for pollinators when applied responsibly.

Research Spotlight: Wood Vinegar in Ornamentals

Science is catching up with what gardeners have long observed: flowers and ornamentals respond strongly to wood vinegar.

- **Vase Life Extension** — Diluted solutions (about 1:600–1:900, or roughly ½ teaspoon per gallon) slow bacterial growth in stems, keeping cut flowers fresher for several extra days and even enhancing fragrance.
- **Ornamental Growth Benefits** — Trials with rhododendrons showed improved nitrogen use efficiency, stronger root growth, and more vigorous foliage — especially valuable in acid-loving ornamentals.
- **Antifungal Action** — Laboratory tests confirm suppression of common pathogens like *Botrytis* (gray mold) and powdery mildew, two of the biggest challenges in cut flowers and roses.
- **Bulb Flower Potential** — While direct studies on tulips or daffodils are limited, broader research indicates wood vinegar improves establishment, pigment intensity, and long-term bulb vitality.

👉 **Bottom line:** The same qualities that make wood vinegar a powerful ally in food crops also shine in ornamentals. From stronger starts to longer vase life, it offers growers a natural, low-dose way to improve performance and reduce losses.

Grower Tips

Ornamentals reward steady care more than occasional intervention. A few habits make all the difference:

- **Prune for airflow:** Especially with roses, rhododendrons, and other dense shrubs — open canopies mean fewer fungal problems.
- **Water wisely:** Deep, infrequent watering builds stronger roots and reduces mildew risk compared to frequent shallow sprays.
- **Pair with biochar:** Adding biochar around the root zone improves soil texture, moisture retention, and microbial balance.
- **Stay consistent:** Preventive sprays at low doses are more effective than waiting until disease pressure is obvious.
- **Sanitation matters:** Remove fallen petals and diseased leaves promptly to reduce the reservoir of fungal spores.

What to Expect

With consistent LunaChar Wood Vinegar use, ornamentals respond in visible and lasting ways. Expect healthier plants, cleaner foliage, and blooms that carry their color and fragrance longer into the season.

- Stronger root systems and greener leaves that stay vigorous through summer.
- Reduced disease pressure, especially from black spot, mildew, and botrytis.
- Fuller, longer-lasting blooms with improved fragrance.
- Shrubs and perennials that hold shape and vitality longer into fall.
- In roses, fewer outbreaks of black spot and powdery mildew, plus extended bloom cycles.

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