

About Wood Vinegar

Wood vinegar is a light brownish liquid that is produced through the natural act of carbonization. This occurs when organic biomass material is heated in an oxygen reduced environment leading to the thermal decomposition of materials and release of volatile elements. The exhaust from this char production is then condensed into a liquid. The condensate then further separates into wood vinegar, bio-oil, and tar.

Wood vinegar has a low pH (around 3) and contains more than 200 organic compounds, which include:

- Water
- Methanol
- Ester
- Acetic acid
- Ketone

These various elements work synergistically for a greater outcome. The composition and properties of wood vinegar depend on feed source materials as well as the method (time/temperature) of pyrolysis.

Wood vinegar has a long history of successful use throughout Asia for the replacement of expensive fossil derived agriculture chemicals. There is evidence of the successful use dating back to thousands of years in the Amazon and even in the 1900s when substantial factories commercially produced wood vinegar with creosote as a source of acetic acid.



Benefits of Wood Vinegar for Organic Agriculture

Wood vinegar reduces the cluster value of water by 1/3. The water is activated and is easily absorbed by the plants and animals due to its small mass. Each of these masses holds one or more of mineral elements. These elements are easily absorbed by plants and will greatly reduce the use of agro-chemicals. However, it should not be combined with alkaline chemicals.

Benefits of Wood Vinegar as Fertilizer

- Stimulates plant and vegetable growth
- Strengthens roots and leaves
- Improved absorption within the roots
- Quantity of microbes
- Increased soil microbial weight
- Improves flavour, colour, firmness, and preservation of fruit
- Crop resistance to adverse conditions
- Thicker and stronger stems
- Higher growth rates
- More resistant to disease
- Stimulate development of crops

Benefits of Wood Vinegar as Pesticide

- Repels pests and insects
- Prevents plant infection from fungal, bacterial diseases and viruses
- Reduce odour
- Preservative for corn

Other benefits

- Enriches soil fertility
- Facilitates composting
- Accelerates seed germination

Wood Vinegar Uses

Wood vinegar is a multipurpose product and replacement of synthetic materials but agriculture is the main commercial application:

- 100% organic fertilizer and pesticide
- Growth enhancement
- Insect repellent
- Fungicide
- Disease resistance

- Soil enrichment
- Accelerates seed germination – more seeds sprout when soaked in wood vinegar first

Wood vinegar is also safe for humans and animals!

Why Use Wood Vinegar?

- Sustainable supply source
- High potential to reduce dependency on limited, expensive agro-chemicals
- Increase seed germination
- Replacement for chemical fertilizers and pesticides

Uses and Application of Wood Vinegar as Fertilizer

- Improve absorption through the roots
- Stimulates plants and vegetable growth
- Strengthens roots and leaves
- Increases the quantity of useful microbes
- Increased soil microbial weight
- Used as penetrant for better uptake.:1:500 of dilution water
- Increase crop resistance to adverse condition
- Improved tree health, darker green leaves for better photosynthesis, thicker and stronger stems, higher growth rates, naturally more resistant to disease.
- Improves fruit quality and increases sugar content in fruit, and stimulate development of crops
- Improve flavor, color, firmness and preservation of fruit
- Works as flavor enhancer for agricultural end products: Mix solution rates of 1:500 to 1:1000. Wood vinegar prevents excessive nitrogen levels, improves plant metabolism and contributes to higher fruit sugar levels.
- Strengthen the photosynthesis
- Increase the content of chlorophyll of the plants
- Reduced fertilizer or other agrochemical volume used with better yields in viticulture and grain crops
- Foliar spray: Dilute one-part wood vinegar with 200 parts water and spray it to leaves once a month. Dilution ratio can be change to 300 parts water for the succeeding applications. Allows better uptake and a reduction of up to 50% use of fertilizers, herbicides and pesticides

Uses and Application of Wood Vinegar as Pesticide

- Repel pests, prevent plant infection from fungal, bacterial and virus-like disease
- Inhibits virus and soil disease when mixed in high concentration
- Repels insects on plants (or deodorizer): Dilute one-part wood vinegar with 20 parts water and spray it the plant or to the substrate in case of odor removal

- Prevents diseases caused by bacteria
- Reduce odor: A wood vinegar solution of 1:50 will diminish the production of odor-causing ammonia in animal pens.
- Repel houseflies. Dilute wood vinegar at a rate of 1:100 and apply to affected areas.
- Repel nematodes: 1:500 (apply to the base of plants)
- Corn preservative
- Control of fungal diseases: 1:200 (spray onto leaves)
- Control of root rot: 1:200 (apply to the base of plants)
- Reduce incidence of chili pepper flowers aborting: 1:300 (spray onto leaves)

Uses and Application of Wood Vinegar to Enrich Soil

- Enriches soil fertility: Dilute wood vinegar with water (1:200 ratio-1-part wood vinegar and 200-part water) and sprinkle it to the soil before planting. Application is one-liter solution for every square meter of planting area.
- Enrich garden soil: Use a strong solution of 1:30 to apply to the garden soil surface at a rate of 6 liters of solution per 1 m² to enrich the soil prior to planting crops. To control soil-based plant pathogens, use an even stronger rate of 1:5 to 1:10.

Other Uses and Applications of Wood Vinegar

- Facilitates composting: There is a growing number of farmers and commercial soil compost producers looking at ways to improve their composting processes while reducing costs and improving the end product. Dilute one-part wood vinegar with 50 parts water and sprinkle to composting materials daily. This will help increase the biological activity of various beneficial microbes and can decrease composting times.
- Seed Germination: Nourishes seeds for germination (Improve seed germination strike rate): Dilute one-part wood vinegar with 200 parts water then soak the seeds for 24 hours. More seeds sprout when soaked in wood vinegar first

Uses and Applications of Wood Vinegar for Animal Husbandry

Chicken, Turkey, Ostrich, Quail

Studies showed that when wood vinegar was used as feed supplements in poultry, salmonella bacteria, which are responsible for gastrointestinal diseases of chickens, were eliminated.

Results

- In chicken egg production, farmers claimed that their hens improved
- Their egg-laying performance improved
- Had better rearing characteristics
- Improved their hatching efficiency
- It also improved the quality of eggs such as
 - Better taste
 - Reduced cholesterol content

- Had harder egg shells

Mixed with water at rates of between 1:500 and 1:600 (1 liter of wood vinegar with 500 liters of water). Wood vinegar reduces the cluster of water to 1/3 and can adjust bacterial levels in the digestive tract which improve the absorption of nutrients from feed and mineral elements of water .

Livestock

Wood Vinegar as supplement for livestock feed. Mixed with livestock feed and water at rates of between 1:200 and 1:300. Wood vinegar can adjust bacterial levels in the animal digestive tract which improve the absorption of nutrients from feed.

Application

The result is non-stimulating Deodorization that is non-toxic and leaves no residue, creating a good-bacteria forming environment that is healthy and fresh for your livestock.

- (a) Improve feed efficiency
- (b) Increase milk production substantially
- (c) Improve fertility rate
- (d) Improved meat quality

Wood Vinegar is suitable for poultry, and other livestock like sheep, cattle, etc. Wood Vinegar is an all-natural livestock deodorant derived from plant extracts. The skin friendly plant chemicals bind themselves to odor-causing agents on the animal's body and wastes, effectively breaking down, absorbing and transforming them into a natural acidic state and destroying and suppressing bacteria, viruses and other odor causing pathogens. It effectively controls the production of odor causing bacteria on the animal and the farm resulting in healthier livestock and increasing yield.

Studies on swine production showed that sows improved their performance. They became healthier, their fertility rate improved, and piglet size became uniform. It has been suggested that wood vinegar can improve the performance of weanling pigs by improving the nutrient digestibility and reducing harmful intestinal coliforms. Moreover, the performance of pigs fed with wood vinegar was found to be better than those fed with organic acid. The fatteners also improved their feeding efficiency and meat quality. The foul odor from the manure of the pigs was also reduced. Furthermore, reports from farmers indicated that their sows increased their milk production and diarrhea among piglets were prevented or cured.

Applications Note

There are so many varied possible uses for wood vinegar, so when deciding on your trial parameters, we recommend considering the following points that we have discovered from experience:

- Wood Vinegar has been using for a penetrant and improved plant uptake by reducing the volume of the existing (more expensive) chemical and replacing directly with wood vinegar it can possibly improve the uptake and have better results than the existing chemical alone with the same or lower input cost
- Wood Vinegar has been using successfully at more regular lower rates when used just as penetrant to help plant uptake when mixed with the dilution water of other chemicals for a minimal outlay.
- Wood Vinegar used alone as a stimulant for seed germination has shown improved strike rate and time for varied species.
- Wood Vinegar shows beneficial plant health at lower rates but at increased concentration can also show detrimental effects to the plant health.

- Wood Vinegar should always be used diluted and strength will vary between foliar and soil application along with frequency of application.
- Longer term regular use has shown signs of much improved plant health and ability to naturally protect themselves
- When applying you need to achieve the correct balance to achieve your desired outcome
- “Dilution Water” is the actual water used to dilute the existing chemical. At 500 times dilution, wood vinegar can reduce the cluster value of water to 1/3. This means that the water is activated and can be easily absorbed by the plants because water with a low cluster value is in a very small mass. Each of these masses will hold one or few mineral elements. These elements can be easily taken into the plants
- Dilution ratio can be stronger for herbicides than fertilizers. The concentration of agro-chemicals or liquid fertilizers can be reduced by 50% if it is diluted in a 500 times dilution solution of wood vinegar due to its higher permeation. This will greatly reduce the use of agro-chemicals. However, it should not be used with alkaline chemicals.
- Maximum recommended quantity of wood vinegar is 5-8 liters/ha for foliar application
- Soil application can increase maximum recommended quantity by 50%

Pyrotech Energy offers all the consulting, engineering issues regarding all the applications of wood vinegar. We strive to make our planet less dependent from chemicals used in conventional agriculture and animal husbandry providing sustainable natural bio-chemicals which are long favored by organic producers worldwide.