

Humiverd & biohumus

HUMIVERD		Cultures	Periods of application (spraying)	Rates of application
concentration of solution (depends on spray equipment)		All cultures	Seeds, tubers, bulbs	0,4-1L
per 1MT of seeds	1:10 - 50	Wheat, sty, oats, millet, sorghum, maize	Shoots 2nd - 3rd leaf	Start
of booting	Next spraying (1-2 times/month)	2-3L per 1H0	2-3L per 1H0	2L per Ha
Potatoes	Shoots 3rd & 4th leaf	Tuber initiation	Tuber bulking	2-3L per 1H0
2-3L per 1H0	1: 100- 1000	Sugar-beet red beet, mangle, carrot	Shoots the 1st pair of original	1,5-3L per 1H0
leaves	During second period (20-35 days after 1st spraying)			1: 100- 1000
1000	Tomatoes, pepper, eggplants	Shoots 3rd & 4th leaf	Start of budding	10-15 days after
2nd spraying	2-3L per 1H0	2-3L per 1H0	1-2L per Ha	1: 100- 1000
marrows, pumpkin	Shoots the 1st -3rd of original leaves	Start of budding	3L per 5000 plants	1L per 5000
plants	1: 100- 1000	Cabbage	1-2 days before cabbage sprouts planting out or after shoots	10-15
days after first fertilizing	Starting period of cabbage head formation		1L per 10.000 plants	2-3L per 10.000
plants	1,5-2,5L per 10.000 plants	1: 100- 1000	Apple-trees, pear-trees, plum-trees, peach-trees, apricot-trees, cherry-trees, etc.	In spring upon appearance of young leaves
per 1 tree	3 ml per 1 tree	1: 300 - 2000	Fruit shrubs, currant, raspberry, gooseberry, etc.	In spring upon appearance of young leaves
3-5 ml per 1 bush	3-5 ml per 1 bush	2-3 ml per 1 bush	1: 100- 1000	Onion Garlic
period of vegetation	Coming out to shaft	1-3L per 100.000 plants	1-3L per 100.000 plants	1: 100- 1000
Grapes	Spring spraying of young leaves	Vegetation period (every 3-4 weeks)	2,5 ml per 1 plant	2,5
ml per 1 plant	1: 100- 1000	Strawberry	Spring spraying of young leaves	Next spraying (every 15- 25 days till harvest)
1 ml per plant or 2-3 L per Ha	1 ml per plant or 2-3 L per Ha	1: 100- 1000	1: 100- 1000	
Vegetable Green fennel, parsley, etc.	First shoots, vegetation starting	Next spraying (5-6 days after 1st spraying)	4-5 L per 1H0	7-8 L per Ha
1: 100- 1000	1: 100- 200	HUMIVERD Liquid Humic fertilizer vermicompost (biohumus) extract for all plants (universal). This high-quality biohumus produced by earthworms Eisenia fetida concentrated extract contains full complex of macro- and microelements, humic substance, growth hormones, soil antibiotics, amino and fulvo acids, fitovitamins and microorganisms. Using humic fertilizer plants uptake more nutrients. Crops contain more vitamins, sugars and protein. Significant decrease in nitrate and heavy metals absorbed. HUMIVERD used as natural germination and growth stimulant, can suppress attacks by pests and diseases. The product promotes better root development and suitable for all plants. From 1 liter of HUMIVERD can be obtained up to 200 liters of fertilizer. Use with 15-25 ° ! water. Dilution ratio 1:200 (30 ml of a filler cap: 6 liters of water). Replanting: 150 ml of diluted fertilizer / plant. Garden plant fertilization (root and foliar) during vegetation period: Every 10 days. Cacti and succulents: fertilize once a month during growing period.		

Dilution ratio 1:100 (1 filler cap 3 liters of water). Seed pre-sowing soaking: soaking tubers and onions - 1 hr., Legume seeds - 6 pm., Radish, lettuce seeds - 12 hours, carrot, cucumber, pumpkin seeds - 24 hours. Bushes and trees after replanting: fertilize once a week. Indoor plants, excluding cacti and succulents: two times per month. Spring fertilization and soil treatment.

Dilution ratio 1:50 (1 filler cap: 1.5 liter of water). One-time vegetable and flower fertilization after replanting, autumn soil fertilization.

Nitrogen (N)	min.2 mg / l	Phosphorus (P)	min.2 mg / l,	Potassium (K)
min. 2 mg / l.	Humic acid	6 & dash; 7, 5 g/l.	Micro elements: Fe, Zn, Mg, Mn, Mo, Co, Na, Se, Va,	
B, S, I, Cu	pH 7.5 & dash; 8.5	Store in dry, dark place separately from food and keep out of reach of children	Store at temperature +5 to +20 ° C	Warranty: 2 years

HUMIVERD Liquid humic fertilizer vermicompost (biohumus) extract for lawns. This high-quality biohumus produced by earthworms Eisenia fetida concentrated extract contains full complex of macro- and microelements, humic substances, growth hormones, soil antibiotics, amino and fulvo acids, fitovitamins and microorganisms. Using humic fertilizer lawn uptake more nutrients, plant becomes more saturated color. Significant decrease in nitrate and heavy metals absorbed. HUMIVERD used as natural germination and growth stimulant, can suppress attacks by pests and diseases. Lawn faster recovers after mechanical damage and climatic conditions. Humic fertilizer promotes better root development and suitable for all types of lawns: decorative, sport and others. From 1 liter of HUMIVERD can be obtained up to 400 liters of fertilizer. Use with 15-25 ° ! water. Recommended evening spread not a cutting day. Area: 2 liters of diluted fertilizer / 10 square meters. Decorative lawn. Dilution ratio 1:400 (30 ml of a filler cap: 12 liters of water). Fertilize once a month. Sport lawn fertilizing. Ratio of 1:300 (1 filler cap: 9 liters of water). Fertilize 2-3 times a month. Declining intensity of lawn use can reduce fertilizer dilution rate or frequency. Spring and autumn fertilization. 1:200 (1 filler cap: 6 liters of water). Seed pre-sowing soaking: 12 hours. 1:100 (1 filler cap: 3 liters of water).

Nitrogen (N)	min.2 mg / l	Phosphorus (P)	min.2 mg / l,	Potassium (K)
min. 2 mg / l.	Humic acid	6 & dash; 7, 5 g/l.	Fe, Zn, Mg, Mn, Mo, Co, Na, Se, Va, B, S, I, Cu	pH
6.5 & dash; 7.5	Store in dry, dark place separately from food and keep out of reach of children	Store at temperature: +5 to +20 ° C	Warranty: 2 years	HUMIVERD Liquid humic fertilizer vermicompost (biohumus) extract for flowers.

This high-quality biohumus produced by earthworms Eisenia fetida concentrated extract contains full complex of macro- and microelements, humic substances, growth hormones, soil antibiotics, amino and fulvo acids, fitovitamins and microorganisms. Using humic fertilizer flowers uptake more nutrients, flowers become more saturated color. Significant decrease in nitrate and heavy metals absorbed. HUMIVERD used as natural germination and growth stimulant, can suppress attacks by pests and diseases. Flowers faster recover after mechanical damage, replanting and climatic

conditions. The product promotes better root development and suitable for indoor and outdoor flowers and decorative plants. From 1 liter of HUMIVERD can be obtained up to 200 liters of fertilizer. Use with 15-25 ° ! water.

Dilution ratio 1:200 (30 ml of a filler cap: 6 liters of water). Replanting: 150 ml of diluted fertilizer / plant. Garden flowers fertilization (root and foliar) during vegetation period: every 10 days in the evening. Cacti and succulents: fertilize once a month during growing period. Dilution ratio 1:100 (1 filler cap: 3 liters of water). Seed pre-sowing soaking: 12 hours., Indoor plants, excluding cacti and succulents: two times per month. Spring fertilization and soil treatment. Dilution ratio 1:50 (1 filler cap: 1.5 liter of water). One-time plant fertilization after replanting.

Nitrogen (N) min.2 mg / l Phosphorus (P) min.2 mg / l, Potassium (K) min. 2 mg / l.
Humic acid 6 – 7, 5 g/l. Fe, Zn, Mg, Mn, Mo, Co, Na, Se, Va, B, S, I, Cu
pH 6.8 to 7.7

Store in dry, dark place separately from food and keep out of reach of children Store at temperature +5 to +20 ° C
Warranty: 2 years HUMIVERD Liquid humic fertilizer vermicompost (biohumus) extract for vegetables. This high-quality biohumus produced by earthworms *Eisenia fetida* concentrated extract contains full complex of macro- and microelements, humic substances, growth hormones, soil antibiotics, amino and fulvo acids and fitovitamins. Using humic fertilizer plants uptake more nutrients. Crops contain more vitamins, sugars and proteins. Significant decrease in nitrate and heavy metals absorbed. HUMIVERD used as natural germination and growth stimulant, can suppress attacks by pests and diseases. The organic product promotes better root development and suitable for all vegetables. From 1 liter of HUMIVERD can be obtained up to 200 liters of fertilizer. Use with 15-25 ° ! water.

Dilution ratio 1:200 (30 ml of a filler cap: 6 liters of water). Replanting: 150 ml of diluted fertilizer / plant. Garden plant fertilization (root and foliar) during vegetation period: every 10 days.

Dilution ratio 1:100 (1 filler cap 3 liters of water). Seed pre-sowing soaking: soaking tubers and onions - 1 hr., Legume seeds - 6 pm., Radish, lettuce seeds - 12 hours. Carrot, cucumber, pumpkin seeds - 24 hours. Spring fertilization and soil treatment.

Dilution ratio 1:50 (1 filler cap: 1.5 liter of water). One-time vegetable fertilization after replanting, autumn soil fertilization.

Nitrogen (N) min.2 mg / l Phosphorus (P) min.2 mg / l, Potassium (K) min. 2 mg / l.
Humic acid 6 – 7, 5 g/l. Fe, Zn, Mg, Mn, Mo, Co, Na, Se, Va, B, S, I, Cu pH 6.8 – 7,7

Store in dry, dark place separately from food and keep out of reach of children Store at temperature +5 to +20 ° C
Warranty: 2 years

HUMIVERD

1000LTR

20LTR Humiverd that we offer is an active

soil enhancer. They are environmentally safe, increases crop yield, stimulates plant enzymes and hormones and improves soil fertility and can be directly applied to the soil. Humiverd is used widely across the globe by agriculturists due to their several benefits. These are known for the following reasons:

- Increases soil fertility
- Increases humus content
- Effectively chelates metals
- Enhance soil phosphate availability
- Breaks up unproductive clay soils and turns into profitable soils
- Increase soil microorganism's metabolic activity
- Stimulates the respiration rates
- Increase root and shoot growth on a fresh and dry weight basis
- Enhances plant root uptake of P, K, Fe, Cu, Zn and Ca.
- Increases microbial and mycorrhizal activity
- Promote nutrient uptake
- Accelerate seed germination
- Increase crop yields
- Enables reduction of frost damage
- Effective soil enhancer
- Plant growth bio-stimulant
- A chelating agent and a disease suppressant
- High in both humic and fulvic acids, auxins, minerals, vitamins, etc
- Environmentally safe
- Water soluble, easy to apply, economical and faster acting.
- Suppresses soil and root pathogens
- Stimulates plant enzymes and hormones
- Suppresses disease, heat stress and frost damage

Promotes antioxidant activity Why is earthworm processed vermicompost (biohumus) better than regular compost?ü Much higher concentration of micro-organismsü Greater sense of variety of microorganismsü Plant growth enzymes can only be found in vermicompostü Plant leaves and roots are strongerü Higher germination rateü Faster growth of plantsü Fast (Return On Investment)ü Plants become more resistant to diseasesü The soil retains more moistureü Significantly high fruit and vegetable yieldü Fruits and vegetables are tastierü Yield contain more vitamins and microelements needed by humansü Flowers do not lose bright and rich colorsü Disease and adverse environmental factor resistant plants (cold, heat)

floods)ü Prevents accumulation of nitrates and heavy metals

BIOHUMUS

1000LTR Biohumus – naturally pure organic microbiological fertilizer – manure and biological waste product produced by earthworms *Eisenia Fetida*. Product contains all the necessary set of macro and micro nutrients, enzymes, soil antibiotics, vitamins, growth hormones and humic substances. Biohumus efficiency: easily absorbed in all plant life cycles; increases productivity, faster-growing and tastier crops, containing more vitamins, protein and sugar; prevents accumulation of nitrates and heavy metals, disease and adverse environmental factor-resistant plants. Usage: Use as main fertilizer in forestry, floriculture, horticulture and gardening for soil revitalization and fertilization. Seeds germination: mix 1 part biohumus and 3 - 4 parts soil. Transplanting vegetables and flowers: mix 1 part biohumus and 3 - 5 parts soil. Transplanting potted flowers: mix 1 part biohumus and 5 - 7 parts soil. Fertilizing indoor flowers and ornamental plants: 0,02 - 0,03 litre (20 - 30 ml) biohumus spread around the plant every 2 months. Fertilizing soil: 0,2 - 0,3 litre/m². Ingredients: biohumus 100%
 Nutrients (mg/kg): nitrogen (N) 11422, phosphorus (P) 8258, potassium (K) 7173
 Microelements: iron (Fe), calcium (Ca), manganese (Mn), magnesium (Mg), zinc (Zn), copper (Cu), boron (B)
 pH 6,5 – 8; moisture 45 – 55%

The Conversion of Organic Wastes into Vermicomposts and Vermicompost ‘Teas’ Which Promote Plant Growth and Suppress Pests and Diseases. Clive A. Edwards*, Norman Q. Arancon*, Tse Chi Kai**, and David Ellery*** Soil Ecology Laboratory, The Ohio State University, Columbus, OH, USA** Sunburst Waste Management Technologies Ltd, Australia Introduction Most people are familiar with the principles of thermophilic composting, which is a microbial process that utilizes certain aerobic microorganisms to break down organic materials such as wastes. This process involves an aerobic, microbial heating process, which raises the temperature of the organic materials to 55Ú – 70Ú C for at least 72 hours, followed by a maturation phase of several days. This process depends on keeping the organic materials aerated, either by turning organic piles mechanically, or by injecting air into enclosed systems. The product has a number of uses as field soil amendments, but has a relatively poor structure and comparatively limited amounts of plant-available nutrients. (Edwards and Bohlen, 1996; Edwards and Arancon, 2004). More recently, there has been considerable world-wide interest and significant technological progress, particularly at The Ohio State University, on the production and optimal uses of vermicomposts. Vermicomposts can be processed from most organic wastes such as animal manures, and particularly, paper and food wastes, through interactions between earthworms and microorganisms, in a mesophilic process (up to 35Ú C), to produce fully-stabilized materials with low carbon to nitrogen ratios. They have high and diverse enzymatic and microbial activities and contents, a fine particulate structure, good moisture-holding capacity and contain nutrients such as nitrogen, potassium, and calcium in forms readily taken up by plants. Vermicomposts can have dramatic effects upon the germination, growth, flowering, fruiting and yields of most crops, particularly fruit and vegetables, which are high value crops. Because vermicomposts are so rich in plant-available nutrients, they tend to perform best in promoting plant growth and yields, at relatively low application rates into plant growth media or soils. It has been shown conclusively at The Ohio State University, that these plant responses may be due to the production of plant growth regulators such as indole acetic acid (IAA), kinetin, or gibberellins associated with humic and fulvic acids also acting as plant growth regulators. These materials are produced through interactions between earthworms and microorganisms. We are convinced that the plant hormones produced become adsorbed on to the humates and fulvates, and are released slowly into soils to promote plant growth over the whole growing season or even several growing seasons. (Arancon et al, 2005a). Production of vermicomposts Since vermicomposting is a mesophilic process, with an upper temperature limit of 35Ú C, it is important to use techniques in vermicomposting systems which minimize the development of thermophilic composting in the wastes. This can be achieved most readily, by adding the organic wastes, at intervals of 1-2, days in thin layers of 1-3 cm, so that no heating occurs. The vermicomposting agents, usually earthworms of the species *Eisenia fetida*, or species with a similar habitat and food needs, remain in the top 10-15 cm of fresh organic wastes, reaching populations of up to 9 kg wet weight of earthworms per square meter, to attain the most rapid processing of organic wastes. The continuous flow, automated vermicomposting systems, that were developed by Professor Edwards and his colleagues in the U.K. and U.S., use this principle of adding layers of organic wastes at the top of the system and collecting the vermicomposts at the bottom, with a retention time in the system of 30-60 days. Such fully automated continuous flow systems were adopted and modified by Sunburst Waste Management in Australia and have been used there for a long period. Such units have also been constructed by this company in Hong Kong and are poised to make a major impact in waste management in this region of China. Uses of vermicomposts Vermicomposts can be produced from a wide range of organic wastes, such as animal manures, biosolids, paper, and food wastes, and those that are produced from the same materials are easy to standardize which is essential for consistent results. They can be used to promote the growth of house and garden plants, and in horticulture, particularly for of fruits and vegetables as amendments to field crops usually in the crop rows. Figure 1. Number of flowers on petunias grown in food waste vermicompost and MetroMixM360 (with all needed nutrients supplied). Solid vermicomposts have been shown to increase the germination rates of growth, flowering, and yields of a wide range of crops such as petunias (Figure 1. Arancon et al, in press), marigolds, chrysanthemums, tomatoes, peppers (Figure 2. Arancon et al 2004), grapes, and strawberries, for both greenhouse and field crops. In the greenhouse, rates of substitution of from 20-40% vermicomposts, into commercial plant growing media, have been shown to be the most effective in increasing crop yields. In the field, application rates of 1.25-5.0 tons of vermicompost per ha have had excellent effects on growth and yields of many crops. Figure 2. Mean yields and mean fruit weights of peppers produced in standard commercial medium (Metro-Mix 360) substituted with different concentrations of food waste vermicompost. Columns followed by the same letters do not differ

significantly ($P < 0.05$, with all needed nutrients supplied). Vermicomposts have also been shown to suppress attacks by soil and foliar transmitted plant diseases, such as *Pythium*, *Rhizoctonia*, *Plectosporium* and *Verticillium*, significantly in both the field and greenhouse. Vermicomposts can also suppress arthropod pests such as caterpillars: including cabbage white caterpillars, tomato hornworms, and cucumber beetles, as well as sucking arthropods: such as scale insects, mealy bugs, aphids (Figure 3) and spider mites (Arancon et al, 2005b, 2006). The suppression of aphids is particularly important, since they are major transmitters of plant viruses. The vermicompost applications to soils appear to make the plants that are grown in them less attractive to the pests but also by suppressing their reproduction. Figure 3 - Development of aphid populations (Means \pm SE) on cabbages, grown in a soilless medium, Metro-Mix 360 (MM360), substituted with food waste vermicomposts. Measurements made over on seven dates over 17 days after infestations. Means designated by * and ** are significantly different at $P \leq 0.05$ and $P \leq 0.01$, respectively. Finally, it has been shown at The Ohio State University that vermicomposts can suppress attacks by plant parasitic nematodes such as tomato cyst eelworm and root knot nematodes such as *Meloidogyne*, on tomatoes and other vegetable crops dramatically. (Arancon et al, 2003). Production of aqueous extracts of vermicompost or "tea"; In recent years, crop growers have been producing aqueous extracts of composts, and vermicomposts, commonly termed "tea", and found particularly that vermicompost "tea" can increase crop germination and growth in ways similar to the solid vermicompost materials and are much easier to apply to crops and soils. Work at The Ohio State University has shown that the best method of producing "tea" is with commercial extraction equipment, using organic wastes that are aerated and soaked for about 24 hours. Vermicompost ratios of waste to water, of 1:5, 1:10, and 1:20 were most effective and economic in terms of treatment costs. "Tea" produced at these dilutions can affect plant growth significantly when applied as soil drenches. It is recommended that the "tea" are used soon after they are produced. Uses of vermicompost "tea"; These aqueous vermicompost extracts or "tea" are much easier to transport and apply, than solid vermicomposts, and can duplicate most of the benefits of vermicomposts when applied to the same crops. Additionally, they can be applied to crops as foliar sprays. Figure 4. Increases in tomato mean shoot dry weights in response to aerated food waste vermicompost "tea" applications compared to a water control to plants growing in MM360 (with all needed nutrients supplied) Work at The Ohio State University has shown that vermicompost "tea" increased the germination, growth, flowering, and yields of tomatoes (Figure 4), cucumbers, and other crops in similar ways to solid vermicomposts. The aerated, vermicompost "tea" suppressed the plant diseases *Fusarium* (Figure 5) *Verticillium*, *Plectosporium*, and *Rhizoctonia* to the same extent as the solid vermicomposts. (Edwards et al, 2006) Figure 5. Suppression of the plant diseases *Fusarium* by drenches of food waste vermicompost and vermicompost "tea" compared to a water control (with all needed nutrients supplied).