

Water Hyacinth (*Eichhornia crassipes*): As a organic manure

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Water hyacinth (*Eichhornia crassipes* (Mart) Solms) is a free floating freshwater plant of the family Pontederiaceae that has proven to be a significant economic and ecological burden to many sub-tropical and tropical regions of the world. Water hyacinth originated from the Amazon Basin and was introduced into many parts of the world as an ornamental garden pond plant due to its beauty. The leaves are broad, thick, glossy, and ovate and float above the water surface. They have long, spongy and bulbous stalks. The feathery, freely hanging roots are purple-black. It is one of the most productive plants on the earth and is considered the world's worst aquatic weed

It tolerates annual temperatures ranging from 21.1°C to 27.2°C and its pH tolerance is estimated at 5.0 to 7.5. The 'beautiful blue devil' water hyacinth, grows rapidly as a dense green mat over stagnant water bodies such as lakes, streams, ponds, waterways, ditches and backwaters and is recognized by its lavender flowers and shining bright leaves. The weed is known as *Jal khumbe* in Hindi, *Pisachitha tamara* in Telugu, *Akasa* or *Vengaya tamarai* in Tamil and as *Kola vazha* in Malayalam. The so called "menace and nuisance" has tremendous potentiality of high rates of vegetative growth. This macrophyte is one of the most invasive aquatic weeds in the world causing a serious hindrance to nation's development activities.

The plant is now considered as a serious threat to biodiversity. The environmental hazards associated with these plants are degraded water quality and drastic changes in the plant and animal community, light and oxygen diffusion are severely curtailed reduction in water movement etc. Other environmental hazards includes clogging of irrigation, hydropower and water supply ways, hindrance of water transport, blockage of canals and

rivers causing flooding. Despite all the problems created by *Eichhornia crassipes* (Mart.) Solms., some positive aspects have been reported. It contains 64% methane and can be used for biogas generation and for water purification. It is also valuable in traditional medicine, biogas production, mushroom bedding material, carbon black production, making of ropes, production of fibre boards, as animal fodders and fish feed, green manure, compost, and as an ornamental plant.

As a fertilizer, water hyacinth can be used on the land either as a green manure or as compost. As a green manure it can be either ploughed into the ground or used as mulch. The plant is ideal for composting. After removing the plant from the water it can be left to dry for a few days before being mixed with ash, soil and some animal manure. Microbial decomposition breaks down the fats, lipids, proteins, sugars and starches. The mixture can be left in piles to compost; the warmer climate of tropical countries accelerates the process and produces rich pathogen free compost which can be applied directly to the soil. The compost increases soil fertility and crop yield and generally improves the quality of the soil. The organic manure gives far more better result than chemical fertilizer and it costs nothing, but only labor. *Eichhornia crassipes* (Mart.) Solms. produces pathogen free rich compost which increases soil fertility, thereby improves the fertility of soil.

Composition of Water hyacinth:

- ✓ Fresh plant contains 95.5% moisture, 0.04% N, 1.0% ash, 0.06% P₂O₅, 0.20% K₂O, 3.5% organic matter.
- ✓ On a zero-moisture basis, it is 75.8% organic matter, 1.5% N, and 24.2% ash.
- ✓ The ash contains 28.7% K₂O, 1.8% Na₂O, 12.8% CaO, 21.0% Cl, and 7.0% P₂O₅.
- ✓ The CP contains, per 100 g, 0.72 g methionine, 4.72 g phenylalanine, 4.32 g threonine, 5.34 g lysine, 4.32 g isoleucine, 0.27 g valine, and 7.2 g leucine.
- ✓ Water hyacinth roots naturally absorb pollutants, including such toxic chemicals as lead, mercury, and strontium 90 (as well as some organic compounds believed to be carcinogenic) in concentrations 10,000 times that in the surrounding water.

Water hyacinth as green manure

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- The plant is ideal for composting.
- After removing the plant from the water it can be left to dry for a few days before being mixed with ash, soil and some animal manure.
- Microbial decomposition breaks down the fats, lipids, proteins, sugars and starches.
- The mixture can be left in piles to compost, the warmer climate of tropical countries accelerating the process and producing rich pathogen free compost which can be applied directly to the soil.
- The compost increases soil fertility and crop yield and generally improves the quality of the soil.
- In developing countries where mineral fertilizer is expensive, it is an elegant solution to the problem of water hyacinth proliferation and also poor soil quality.
- It contains many trace elements, seldom found in synthetic fertilizers, so it helps plants to be more disease resistant. The nutrients in the compost are not leached out by rain-water and all available to the plants.



Water Hyacinth

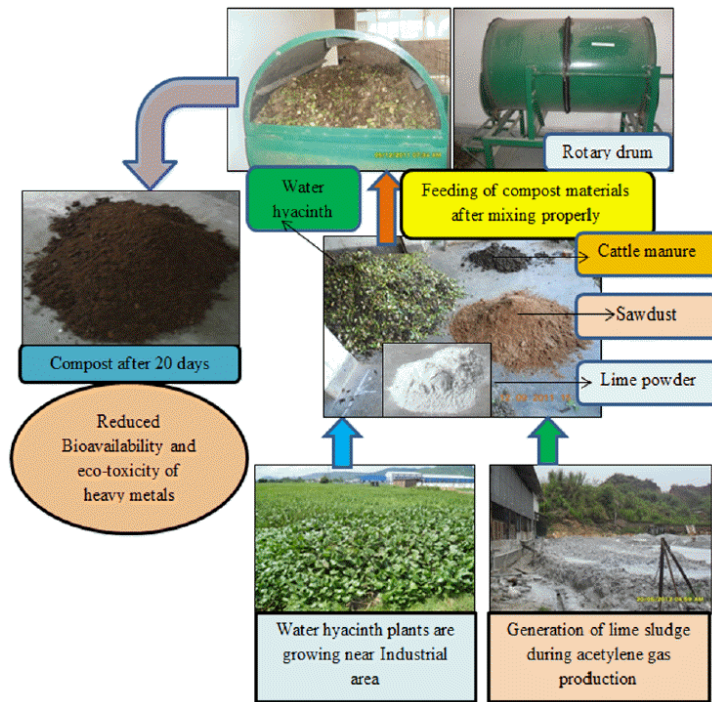


Processing of water hyacinth as a green manure

Preparation of Water Hyacinth Manure

For preparation of water hyacinth (*Eichhornia crassipes* (Mart) Solms.) green manure about 3 kg of the plant material was cut into small pieces and composted in soil for forty five

days under shade. Water was sprinkled after every layer in order to maintain moisture content. The manure was mixed with soil before sowing.



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