

Fish Amino Acid – An Organic Liquid Fertilizer

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SUMMARY

Fish wastes along with brown sugar / jaggery is used to produce Fish Amino Acid and it is a liquid fertilizer. Fish Amino Acid is widely used for organic farming in Japan and Korea. Fish Amino Acid do not affect the water and soil quality. They act as good source of nitrogen and promotes the growth of plants. FAA is either applied as a soil drench or a foliar spray to improve the crop yield. They maintain a healthy soil environment by increasing the growth of beneficial microorganisms. FAA increases the chlorophyll content and enhance the photosynthesis. They also improve the crop's immunity.

INTRODUCTION

Depending on the level of processing or type of fish, 30–70% of the whole fish is fish waste. Over the years fish wastes are used to improve the ecological and economic sustainability of the fish industries by producing fertilizers. Fish meal, compost and liquid fertilizer are some forms of commercial fish-based fertilizers. These fertilizers are used for both horticultural and agricultural crops. Fish amino acid (FAA) is a liquid fertilizer and it is produced by mixing fresh fish wastes (skin, bones, head and other tankage parts) with jaggery or brown sugar. Fish amino acid is used with other Natural Farming inputs to improve the crop yields by increasing the N availability in soils and minimize leaching. It is applied as either a soil drench or a light foliar mist to maintain plant health by improving the chlorophyll production.

How to prepare Fish Amino Acid?

- FAA is an organic compound and used to improve the plant's immunity. The main ingredient in fish amino acid preparation is fish. It is widely used by many gardeners today.
- Fish by-products and brown sugar / jaggery should be taken in equal amounts. If 1kg of brown is taken, then 1 kg of fish waste is taken.



Fig 1. 1Kg fish waste is taken



Fig 2. 1Kg Brown sugar is taken



Fig 4. A layer of brown sugar is added above the fish waste



Fig 3. A layer of fish waste is added to the plastic container



Fig 5. Another layer of fish waste is added above the layer of brown sugar



Fig 6. Fish waste is covered by an alternate layer of brown sugar until the container is nearly full



Fig 8. After 3 to 5 days fish wastes begin to liquefy



Fig 7. The plastic container is closed and kept away from direct sunlight



Fig 9. Fish Amino Acid - Liquid fertilizer

- A plastic container or clay jar is used for fermentation. A layer of large rocks is placed at the bottom of the container to provide minor minerals, aeration and space for collection of liquids produced during the fermentation process.
- Fish by-products and brown sugar are placed in alternate layers till the container is nearly full. The ending layer should be of brown sugar such that no fish is exposed.
- The container is placed in a cool dry place and kept away from direct sunlight.

- The fish wastes will start to break down and liquefy after 3 to 5 days through the fermentation process. The added brown sugar generates osmotic pressure which also helps in the liquefaction process.
- After 10 days the liquid portion is filtered and used as a fertilizer. However, to produce a ready to use FAA, it will usually take 2 to 6 months.
- The completely fermented FAA will have a sweet and slight fishy odor.
- Decant only the liquid portion from the container and this is used as fish amino acid.

Mechanism of Action:

- Fish proteins contains peptides and amino acids. These are absorbed by plants directly for protein synthesis.
- FAA is used as N source by plants which gives high yield.
- FAA is used by plants to produce various enzymes which enhances the anabolic metabolism of plants and helps in early maturity of plants.
- Microbes secretes protease which hydrolyse proteins into amino acids and these are directly absorbed by the plants.
- Beneficial microorganisms absorb the amino acids and peptides which increases their numbers. This improves the soil's ability to retain water and ecological environment.

Benefits of fish amino:

- Fish Amino Acid promotes the growth of plants as they are rich with nitrogen content.
- FAA provides a healthy soil environment by maintaining the biomass of earthworms and microorganisms.
- FAA enrich the nutrients of the soil and increases its fertility.
- FAA enhances the photosynthesis and promotes the growth of crops. The crop yield is increased by 10%-40%.
- FAA also improves the resistance ability of crops.
- FAA is applied as a nitrogen source to improve growth and size during the vegetative stage and not at the reproductive stage.
- Commercially available fertilizers are used as nitrogen source to improve crop yields and plant growth. The excessive use of these fertilizers contaminates the ground and surface waters. FAA can be used as they can increase the nitrogen content in the soil and promote the plant growth without changing the water quality.

Application:

- Fish Amino Acid is either applied directly to soil or applied as foliar spray over the leaves.
- FAA: Water as 1: 1000 – 2000 is sprayed 2-3 times in a season.

Preservation of FAA:

- FAA should be preserved at a temperature range of 23 – 25 °C.
- FAA should be stored at cool place and should not be placed at direct sunlight.

CONCLUSION:

The Fish Amino Acid (FAA) is an organic liquid fertilizer made from fish. FAA is a good source of nutrients and provides various types of amino acids. FAA improves the nitrogen content in soil and promotes the growth of plants and microorganisms. Commercially available fertilizers are cost effective in increasing the nitrogen content in soil but they affect the soil and water quality. However, FAA improves the soil and water quality without affecting it. Hence Fish Amino Acid is one of the best alternatives to commercially available nitrogen fertilizers.

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