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Fish Amino Acid – A Review

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Abstract: *During the fish processing, there are more than 60% of by product as waste which includes skin, head, viscera, trimmings, liver, bones and roes. These products contain good nutrient sources to plant growth and development. In view of utilizing these waste products into a good plant nutrition by fermenting them with country jaggeryand well repined Papaya in the ratio of 1:1:1. These products are mixed well and air tighten it. Leave it for fermentation upto 45 days. After 45 days well fermented Fish Amino Acid is ready touse. Fish Amino Acid Liquid (Fish Protein Hydrosylates) help plants regulate phototropism, photosynthesis, stimulate carbon and nitrogen metabolism, enhance nutrient availability in plant growth substrates, increase nutrient uptake and nutrient-use efficiency. This method of preparing Fish Amino Acid is very cheaper and every farmer can produce by themselves. Fish Amino Acid also improvethe soil fertility and microbial activity in the soil. Fish Amino Acid also act as insect repellant to plant.*

Keywords: Fish Amino Acid, plant growth, nutrient, fermentation.

I. INTRODUCTION

Commercially available fertilizers are a cost-effective means of supplementing soil with nitrogen (N) for plant growth and high crop yields. however, improper or excessive use of N fertilizer can lead to nitrate pollution of ground or surface water (Foley et al. 2012). Producers can minimize this predicament by implementing Best Management Practices (BMPs) for fertilizer use that reduce nutrient losses and avert runoff and leaching from agricultural lands.

Various organic preparations viz., Panchakavya, Amirthakaraisal, Fish Amino Acid (FAA), egg amino acid (EAA) and Vermiwash are being used for improving crop growth and development. Among these organic preparations, Panchakavya has been scientifically evaluated for its physical, chemical and biological properties as well as effect on growth and development of many crops. But in case of Fish Amino Acid research findings on its growth effects on crops are very meager. The Fish Amino Acid is liquid organic manure made from fish waste. Fish Amino Acid is of great value to both plants and microorganisms in their growth, because it contains various nutrients and types of amino acids. Foliar application or a soil drenching of Fish Amino Acid could maximize uptake and minimize runoff or leaching, providing just enough N to the plant for the production of chlorophyll to maintain plant health. Fish Amino Acid diluted with water (1:1000) with other natural farming inputs and applied as a foliar spray as well as soil drench increased the fruit numbers in tomato (Aung and Flick, 1980). Natural Farming incorporates the use of indigenous microorganisms (IMO) (Park and DuPonte 2008) and Fish Amino Acid (FAA) to increase N availability in soils and improve crop yields while sustaining water quality. This fact sheet addresses the production and use of Fish Amino Acid in Natural Farming.

1.1 Fish Amino Acid

Fish Amino Acid is an effective organic liquid fertilizer for growth of fruiting trees and for its blooming. Fish Amino Acid (FAA) is a Natural Farming supplement that is abundant in amino acids and nutrients. Brown sugar, fish waste, irrigation water, well ripened Papaya and little time are all you need to make Fish amino acid. Fish emulsions have been documented to promote seedling growth (Murray and Anderson 2004), fruiting (Aung and Flick 1980), and microbe

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action in the soil (El-Tarabily et al. 2003). One such emulsion, fish amino acid (FAA), is produced by fermenting fresh fish by-products (bones, head, skin, and other tankage parts) with brown sugar. FAA is used in conjunction with other Natural Farming inputs and applied as either a light foliar mist or a soil drench to maximize uptake and minimize runoff or leaching, providing just enough N to the plant for optimum uptake and the production of chlorophyll to maintain plant health. The characteristics of fish amino acid (Table.1)

Table. 1 Characteristics of fish amino acid

Category	Characteristics
Colour	Dark brown
Odour	Pleasant Fish Odour
Solubility	100% Water Soluble
Form	Liquid
Storage	Store in air tight containers in ambient temperature
Used as	Organic Fertilizer

Preparation of fish amino acid

Materials required:

- Fish waste (10 kg),
- Country jaggery (10 kg),
- Well repined Papaya (10 kg).

Procedure:

Collect fish waste (head, bones, skin, fins, viscera) from deep sea, blue-back fish (mackerels, sardines, skipjack tuna, etc.). Weigh 10 kg 0f fish waste (figure.1)

↓

Collect 10 kg of country jaggery from locally available area (or) manufacturer without any other materials added (figure.2)

↓

10 kg of well repined papaya (figure.3)

↓

Select a fermented plastic jar,cover the container with the lid (cap)

↓

Place the one layer of fish waste on the bottom of the container and one layer of powdered country jaggery and papaya (figure.4)

↓

Mix it well

↓

Like this make 5 to 6 layers in the container

↓

Cover the container with a lid (cap) and store out of direct sunlight in a cool, well-ventilated location secured from animals.

↓

After approximately 3 to 5 days, the fish waste will begin to break down and liquefy through fermentation and the osmotic pressure generated by the addition of brown sugar. However, the process takes 2 to 6 months to complete, producing mature FAA that is ready to use. FAA, when completely fermented, will have a sweet, slightly fishy odor (figure.5)

↓

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Decant or pour off only the liquid portion from the fermentation container to use as FAA. Filter, it using nylon mesh to get 300-500 ml solution changed into honey-like syrup. The remaining solids can be used to make IMO#5 (Park and DuPonte 2008) or placed in your compost pile.

Figure.1 fish waste

Figure.2 country jaggery

Figure.3 well ripened papaya

Figure.4 Place the one layer of fish waste on the botoom bottom of the container and one layer of powdered country jaggery and papaya

Figure. 5 fermented fish amino acid

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Fish Amino Acid Specification

Table.2 fish amino acid specification

Parameter	**Percentage (%) / ppm**
Protein	40 %
Nitrogen(N)	6.5 %
Phosphorus(P)	1 %
Potassium(K)	1.5 %
pH	6.5
Total Organic Carbon	25 %
C: N Ratio	4:1
Sulphur(S)	0.8 %
Sodium (Na)	1.0 %
Calcium (Ca)	15 ppm
Magnesium	15 ppm
Ferrous	5 ppm
Manganese	5 ppm
Zinc	17 ppm
Copper	5 ppm
Boron	7 ppm
Molybdenum	0.5 ppm

Source: https://www.janathafishmeal.com

Table.3 **Amino acid profile**

Parameter	**Percentage (%)**
Lysine	3.45
Methionine(N)	0.72
Histidine	1.79
Valine	2.83
Isoleucine	1.12
Threonine	1.30
Tryptophane	0.25
Arginine	1.57
Leucine	1.46
Phenylalanine	0.45
Tyrosine	1.01
Cystine	0.48
Aspartic acid	3.17
Serine	1.20
Glutamic acid	7.25
Proline	2.82
Glycine	5.09
Alanine	3.11
Hydroxyproline	1.18

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Uses

IMPROVES SOIL EUPHORIA

One of the important and fundamental aspects of plant life cycle would be seed germination. Organic Marine Nutrient Crude when mixed with the soil boosts the seed germination along with early robust seedling. It also improves healthy root systems.

A GOOD SOIL EUPHORIA LEADS TO GOOD CROP YIELD AND EFFICIENT PLANT GROWTH.

This can be enhanced by using fish amino acid. This facilitates integrated soil management helping it improve the soil structure. The key value of this product lies in its ability to fix the soil health through a process of right application. Fish amino acid facilitates the acquisition of essential nutrients by holding up metabolic process in the soil and plants.

FISH AMINO ACID [SOIL BOOSTER] PROVIDES NECESSARY NUTRIENTS FOR PLANTS TO THRIVE

Fish amino acid caters the best essentials for plants to increase the number of functional leaves as well as the circulatory system of the stem, shoot and root mass. Fish amino acid acts as a catalyst to help the plant grow and also develop and produce the best yield. A plant that lacks the essential nutrient will not complete its life cycle of developing good and strong roots or generate a healthy stem and in blossoming flowers along with the seed production. Fish amino acid [Fish Fertilizer] in the right proportion gives you healthier plants and are robust.

FISH AMINO ACID [SOIL BOOSTER]PRESERVES PLANTS AGAINST VARIOUS DISEASES

Fish amino acid is the best supplement to double your harvest. The use of Fish Protein Hydrolysate soil absorption of the microorganisms. Unlike the chemical fertilizer Fish amino acid helps to regenerate the soil and protects it from diseases also helps in resisting the pests. Fish amino acid supports the natural cycle of the soil giving it a boost producing healthy and best yields for a farmer.

FISH AMINO ACID [SOIL BOOSTER] IMMUNIZES PLANTS AGAINST VARIOUS DISEASES

Fish amino acid has been engineered in the most efficient process.We all know that farm lands are losing their fertility and which has invariably affected the agricultural productivities. Fish amino acid Immunizes plants against various diseases and helps in bridging the gap in quality and quantity in agricultural produce. The soil mineral imbalance caused by a chemical fertilizer and which destroys the soil structure generally produces plants which have low immunity. Application of Fish amino acid along with soil focuses on increasing the efficiency of nutrient uptake of the plants thus making it strong against various diseases.

FISH AMINO ACID SOIL BOOSTER] ACCELERATES ENVIRONMENTALLY FRIENDLY AGRICULTURAL PRACTISE

Fish amino acid is one such product which encourages myriad of incredible benefits for farming and agriculture as it promotes ecological balance and also supports a healthy environment. Fish amino acid helps in improving crop performance under environmental stress. A good feed to the soil is very essential as it works longer when compared to chemical fertilizer providing the plant well balanced blend of nutrient sources. The best part is, it is produced from fish which is a renewable aquatic resource and it contains phosphorous which helps in overall plant health with strong root systems.

Method of application

Foliar application: Fish Amino Acids fertilizer is suited as a foliar application for boosting crops from early to late stages of maturity. Trace elements, minerals and complex organic compounds are absorbed into the plant's leaf surface and are rapidly trans located to the roots. Foliar absorption is immediate. Increased brix (sugar/mineral) levels can be measured within 20 minutes. Residues left on the leaf surface help suppress insect and fungal attack by encouraging fungal bacteria and reducing insects leaf palatability - most pest insects dislike plants with higher brix levels.

Soil application: Fish Amino Acids fertilizer can be used as a soil drench to encourage rapid microbial and earthworm activity, especially where chemical usage has decreased soil biological activity in the past. Following application, stored sugars are released from the roots as energy for growth and fruit/tuber production. Root hairs exude sugars and these stimulate healthy microbial activity in adjacent soil. These microbes flourish & immediately begin unlocking stored nutrients from the soil.

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Dosage

Foliar spray: Apply 1000-1500ml per hectare (2-3ml per litre of water)
Drip irrigation: Apply 2000-2500ml per hectare.

II. CONCLUSION

Commercially available fertilizers are a cost-effective. This method of preparing Fish Amino Acid is very cheaper and every farmer can produce by themselves. Fish Amino Acid also improve the soil fertility and microbial activity in the soil. Fish Amino Acid also act as insect repellant to plant.

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