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Natural Farming: Fish Amino Acid

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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. 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 FAA in Natural Farming.

What Is FAA?

Fish emulsions have been documented to promote seedling growth (Murray and Anderson 2004), fruiting (Aung and Flick 1980), and microbe 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.

How Is FAA Made?

1. Collect fish waste (head, bones, skin, fins, viscera) from deep sea, blue-back fish (mackerels, sardines, skipjack tuna, etc.).
2. Weigh the fish waste and mix with an equal amount of brown sugar (1:1 ratio by weight) (Figure 1).
3. Select a fermentation container (clay jar, plastic cooler) and place a layer of large rocks at the bottom to provide aeration, minor minerals, and an area where the liquids will collect during the fermentation process.
4. Place a layer of the fish by-product and brown sugar mixture on the rock layer and cover with more brown sugar. Continue with alternating layers of the fish by-product mixture and more brown sugar until the container is nearly full (Figure 2), ending with a layer of brown sugar. Do not leave any fish exposed.
5. Add a handful of IMO#4 and a little Oriental Herbal Nutrients (OHN) to accelerate the fermentation process (Park and DuPonte 2008).
6. Cover the container with a breathable cloth to keep out insects but allow aeration, and store out of direct sunlight in a cool, well-ventilated location secured from animals.
7. 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

Figure 1. Mix fish scraps with equal parts brown sugar (1:1 by weight).

Figure 2: Alternate layers of fish and brown sugar, finishing with a layer of brown sugar.

is ready to use. FAA, when completely fermented, will have a sweet, slightly fishy odor.

8. Decant or pour off only the liquid portion from the fermentation container to use as FAA. The remaining solids can be used to make IMO#5 (Park and DuPonte 2008) or placed in your compost pile.

How Is FAA Used?

FAA is applied as a source of nitrogen during the early or vegetative stage of development to boost growth and size. Do not apply FAA if plants are at the reproductive stages of their production cycle when flowering or fruiting is desired.

FAA is diluted with water (1:1,000) (Table 1) or used in a "cocktail" with other Natural Farming inputs and applied as a light foliar spray or soil drench. For leafy vegetables, spray weekly to improve yields, fragrance, and taste (Pline-Brown and Davis 2007). Avoid spray applications during full sunlight hours to prevent foliar burning and evaporation of the solution before the plant has had a chance to absorb it.

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Table 1. Preparation of 1:1,000 FAA Solutions

Water volume	Amount of FAA (select ONE column only)		
	Kitchen utensil measurements	Fluid ounces (fl oz)	Milliliters (ml)
½ gallon	⅓ teaspoon (tsp)	0.06	2
1 gallon	¾ tsp	0.13	4
5 gallons	1¼ tablespoon (Tbsp)	0.64	19
10 gallons	2½ Tbsp	1.28	38
25 gallons	little less than ½ cup	3.2	95
50 gallons	little more than ¾ cup	6.4	189

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