Balanced Fertilization Strategy (BFS) Program: The FPA Commitment in the OneDa Approach

Rationale

The rising price of inorganic fertilizers globally is one of the burdens our agricultural farmers are facing right now. This is due to the dependency of our country to import because we do not have the capacity (raw materials) to produce our own type of inorganic fertilizers.

Due to unprecedented increase in fertilizer prices, the Department of Agriculture through the OneDA approach through the Balanced Fertilization Strategy (BFS) Program, pushes for the use of combined organic and inorganic inputs and other forms of strategy (i.e. cover cropping or green manuring, individual farmer soil fertility map, improve cropping systems, etc.) to attain the maximum potential of farmlands while promoting balanced fertilization in maintaining soil fertility.

Sustainable agricultural production requires a balance between the inputs and outputs of nutrients in the agro-ecosystems. Excessive use of inorganic fertilizers and other inputs in agricultural production may lead to soil deterioration, affect soil health, decrease sustainability, and in the long run, may create negative impacts on crop yield.

The said strategy applies the concept of 4Rs in fertilization: Right Source, Right Placement, Right Amount, and Right Rate to help enhance soil health and productivity, prevent the decline in soil fertility, and improve fertilizer availability and costs.

The BFS Program is seen to enhance the agricultural production landscape with improved soil structure, and the judicious use of fertilizers towards a food-secure and resilient Philippine agricultural industry, with empowered and prosperous farmers and fisherfolk.

Introduction

In pursuit of protecting the agro-ecosystem and advancing long-term solutions for fertilizer price and supply, essential means of strategy on how to mitigate said global challenge is called for, and one of these is through the Balanced Fertilization of which the Fertilizer and Pesticide Authority (FPA) is recommending.

Balanced Fertilization Strategy (BFS) is a recognized site-specific nutrient management to improve fertilizer use efficiency and refers to the application of plant nutrients in optimum quantities in the right proportion through the appropriate methods at the time suited for a specific crop and agro-climatic condition that leads to soil health building (BSWM, 2020).

The BFS is seen to provide a solution to provide optimum/judicious use and/or combination of inorganic fertilizers and organic materials or other forms like rice straw, livestock and chicken manure, green manuring properly composted and managed to supply the plants with the appropriate nutrients to ensure that the crop can sustain high

production and yield over long cropping periods preserving the nutrients and improving soil structure.

Legal Basis

Presidential Decree 1144 Series 1977

Section 6, 11-7 of PD 1144 Series of 1977, signed by President Ferdinand E. Marcos on 30 May 1977, mandates the FPA to regulate and control the quality of the different grades of fertilizers and set new grade when necessary to ensure adequate supply of fertilizers. It is also stated, that FPA shall have jurisdiction over the existing handlers of fertilizers and other agricultural chemical inputs and may call upon any department, bureau, office, agency or instrumentality of the government including government-owned or controlled corporation or any officer or employee thereof and on the private sector for such information or assistance as it may need in the exercise of its powers and in the performance of its functions and duties.

Liberalization of fertilizers impacts users

Because of the implementation of the Tariff Reform and Import Liberalization Program in 1986 leading to the liberalization of fertilizer importation and other agricultural products, the government has since then stopped imposing import quotas for fertilizer and reduced the corresponding import duties and tariffs on fertilizer imports (Briones, 2020).

Thus, the FPA has since lost its capacity to "assure the agricultural sector of adequate supply of fertilizer and pesticide at reasonable prices..." as stipulated under PD 1144.

Memorandum Circular No. 1 series of 1986

In response, FPA issued a Memorandum Circular No. 1 series of 1986 which provides the decontrol guidelines for the fertilizer industry. This issuance relinquished the FPA of its control over procurement of fertilizers particularly on the determination of import requirements and allocation of import volume, and conducting tenders or canvasses for fertilizer importations.

Proclamation No. 1071, Series 1997

Whereas, Proclamation No. 1071, Series of 1997, signed for its effectivity by President Fidel V. Ramos on August 27, 1997, is authorizing the Department of Agriculture and its instrumentalities to adopt the Balanced Fertilization Strategy. Among the objectives of the proclamation are the dissemination of guidelines for strategic distribution of appropriate fertilizers which are affordable, efficient production and distribution of organic and inorganic fertilizers, redirection of Research and Development on Balanced Fertilization, and establishment of a Fertilizer Watch System (FWS) at national, regional, provincial, and municipal levels to monitor and evaluate the quantity and quality of all commercial fertilizers.

Based on this Proclamation, the FWS helps to monitor and evaluate the quantity and quality of all commercial fertilizers, which is one of the mandates of the Fertilizer and

Pesticide Authority to assure quality, safe and affordable fertilizers for the farmers and end-users.

Memorandum Circular No. 20, Series 2020

Likewise, Memorandum Circular No. 20, Series of 2020 titled: Adoption of the adaptive balanced fertilization management and enhanced crop production and increased income for rice farmer was issued and approved by the Department of Agriculture Secretary William D. Dar, Ph.D. on June 3, 2020. Based on the circular, the Secretary instructed all the DA Staff Offices, Regional Field Officers (RFOs) and its attached agencies, bureaus, corporations to coordinate with the BSWM for technical assistance on the implementation of the Adaptive Balanced Fertilization Management.

With these issuances, and the vital role of the FPA to support the continued efficient fertilizer use to sustain food supply through the Plant, Plant, Plant Program of the DA, to correct the dismal situation wherein fertilizer prices are high, the existing situation of excessive depletion of soil nutrients leading to nutrient imbalances; a need to practice the use a combination of inorganic and organic fertilizers and other forms as an effective strategy to make available most if not all of the essential nutrients needed by plants; and for the balanced fertilization strategy to be one of the best solutions to assist farmers.

Understanding Fertilizer Price Increase: Why the Need for BFS Program

Factors influencing global fertilizer situation price trend

World fertilizer market situation

The **COVID 19 pandemic** brought significant impact to the price trend as each country tried to secure domestic food production by increasing their crop areas. For instance, big countries like India, Australia, and Brazil have increased fertilizer demand than their prepandemic requirement.

The recent **gas shortage in Europe** made domestic fertilizer manufacturers to cut production due to **hike in energy prices**. The region now has to compete in the global fertilizer demand. Fertilizer prices in North Africa (Egypt) and the Middle East prices have been also moving upward.

China curtails fertilizer exports

With the rise in energy prices, fertilizer manufacturers in China cut their energy use. The Chinese government also made the decision to reduce carbon emission in preparation to their hosting of 2022 Winter Olympic Games. **Reduced energy and carbon use** now means reduced fertilizer production of the country.

Moreover, with the **implementation of the China Inspection and Quarantine (CIQ) policy**, fertilizer exports were curtailed due to complex procedures and strict measures for export cargoes. Urea, DAP, MOP, NPK and other fertilizer grades are among the items covered by the CIQ policy. In addition, China has to secure its domestic fertilizer requirement first.

South Korea immediately felt the impact of said Chinese policy. Now, it has to source out its urea demand from other countries at higher prices. **Urea** is vital to the country for it is being **used as fuel to diesel cars and cargo trucks**.

Price increase of fertilizer grades

Today's fertilizer crisis is different from the 2008 crisis which was more financial in context. The *status quo* is more complex which is interlinked to the problems brought by the pandemic, issues on food security, energy shortage, and monopoly and control of powerful countries when it comes to trading. The reason behind the price increase of various fertilizer grades are as follows (HeartyChem Corporation):

- **Urea (nitrogen)** The hike in urea prices started from Europe and aggravated by the China restrictions for cargo exports until it was felt all over the world. For instance, Korea is buying it close to USD1,000/MT Cost FR FO in bulk. It was USD230-240/MT CFR at the beginning of 2021.
- **DAP (di-ammonium phosphate)** Due to China CIQ policy, DAP prices started to soar with fixing price now moving close to USD1,000/MT in bulk from USD600/MT CFR in Korea last September 2021. For the fourth quarter, India recorded price of Phosphoric Acid at USD1,330/MT CFR in bulk from the USD170/MT in the third quarter.
- **MOP (muriate of potash)** Large volumes of imports from Brazil and the increased demand in Belarus affected global MOP prices. At the beginning of 2021, it was USD230-240/MT CFR, but it is now close to USD700/MT CFR.
- **NP/NPK (nitrogen and phosphorous/complete)** With the soar in raw material prices', NP/NPK prices are moving upward continuously. This increase has been propelled mainly by the Chinese export policy on legal inspection. With ceased China NP/NPK exports, other producers in the world are moving up the prices along with increasing feedstock prices.

Philippines a net importer of fertilizers

The country has been for a long-time a net importer of fertilizers. About 90% of the country's needs for fertilizer are mostly imported from China, Indonesia, and Malaysia. Some are being imported from Qatar, Canada, Korea, and the Middle East (Table 1).

Local production accounts for only 10% of the country's fertilizer supply namely: Atlas Fertilizer Corporation and the Philippine Phosphate Fertilizer Corporation (Philphos). Moreover, Philphos has only the capacity to operate at 20% while its raw materials being used are likewise imported. Small to medium sized fertilizer manufacturers also contribute to the local production but in smaller quantities.

Source/Country	Volume	Value	Percentage
	(MT)	(\$)	(%)
Total Importation	2,609,097.83	600,130,219.02	90
China	1,080,808.02	224,004,457.02	37
Indonesia	480,902.57	126,442,155.63	17
Malaysia	362,217.00	89,807,544.09	13
Qatar	199,099.98	55,463,589.81	7
Canada	139,214.55	36,189,023.26	5
Japan	117,000.00	13,149,550.00	4
Korea	103,780.30	27,401,712.30	4
Others	126,075.41	27,672,186.91	4
Total Local Production	276,524.74	130,279,243.40	10
Total Supply	2,885,622.57	730,409,462.42	100

Table 1	1. Exporters	of Six	Major	Grades	of Fertil	izer in	2020
	L	,	,		,		

Global Scenario: Increased fertilizer demand

With the Philippines dependence on imported fertilizers, the current global demand greatly affects the entry of fertilizer. This caused limited local fertilizer supply that influenced the escalation of local prices.

According to the World Bank (2021), fertilizer prices are expected to stay high over the remainder of 2021. Their report indicated that an increase in the importation demand of fertilizers were recorded, particularly urea, in countries like the US, Brazil, India, and Australia. These countries have increased production area for corn, soybeans, and wheat requiring large volumes of agricultural fertilizer inputs.

As such, some countries have also made an advanced booking of fertilizer particularly urea to meet their domestic demand. India has already made an advance booking of fertilizer supply (1.8M MT) for them to meet their domestic demand of approximately \$501/MT. In the US, prices of corn are fueling expectations of higher demand for urea, hence higher prices. In Australia, a forecast of a 2% yearly increase in fertilizer demand has been recorded, with crop areas expanding by almost 400,000 hectares yearly in New South Wales. In Brazil, corn production has been increased for livestock use (forage) whereby urea imports grew to 8 million MT until 2022.

Moreover, China, the highest origin of Philippine fertilizer imports, has allocated their local fertilizer production for their domestic use. This resulted in reduced fertilizer exports to the Philippines.

Increased cost of raw materials

The World Bank (2021) reported that the high price of fertilizers has been bolstered by increased prices of raw materials to produce fertilizers. For instance, the cost for phosphates raw material costs, particularly sulfur and ammonia, have increased sharply due to COVID-19 restrictions on transport that caused limited input supplies. In addition, urea feedstock costs have also risen, including natural gas prices (to produce urea) which jumped in early 2021 due to unusually cold weather.

Increased transport and logistical expenses from importation to retail

The increased transport expenses in the delivery of fertilizers from its country of origin to local dealer's level also affected local fertilizer prices. Among the overhead expenses include duties, arrastre, wharfage checkereage, stevedoring, weighing or bagging and trucking (Table 2). This will be incurred upon the landing of fertilizers from port to its transport to the distributor's warehouse and to the different dealers nationwide. An increase in freight cost in ASEAN has been also recorded from \$20 to \$40 in recent months.

Table 4 illustrates the imputed costs across the supply chain – from the time fertilizer is unloaded in our ports to the point the dealers sell it to farmers. For instance, if the import price is \$700 per metric ton, the computed price per bag (at a foreign exchange rate of Php50.00 per \$1) is Php1,750. Add the duties, arrastre and stevedoring (which is around 3% of import price according to industry standards), then you come up with the landed cost of Php1,803. The importer and distributor then shall impute their margins and costs at 7% and 10% respectively for logistics, labor, and local tax to come up with importer's price to distributor's price to dealer. Finally, the dealer's price to farmers shall now include all the imputed costs across the supply chain would be approximately Php2,376.

Import Price	%	400USD	450USD	500USD	550USD	600USD	700USD	800USD	1000USD
Price per bag in Peso	1 USD = 50Php	1000	1125	1250	1375	1500	1750	2000	2500
Duties		9.14	11.22	13.44	15.41	17.84	21.21	24.23	29.81
Arastre		7.86	8.58	9.25	9.64	10.23	12.16	13.46	17.01
Wharfage		1.88	2.05	2.21	2.30	2.44	2.90	3.45	4.61
Checkerage	3%	0.66	0.72	0.78	0.81	0.86	1.03	1.22	1.70
Stevedoring		4.43	4.84	5.22	5.43	5.77	6.86	8.16	9.95
Weighing		0.41	0.45	0.49	0.51	0.54	0.64	0.76	0.90
Trucking		5.63	6.14	6.62	6.90	7.33	8.71	9.36	11.13
Landed Cost		1,030	1,159	1,288	1,416	1,545	1,803	2,060	2,575
profit/bag		37.67	31.24	33.62	35.64	37.52	44.61	50.06	63.53
Trucking		31.39	39.06	42.03	44.55	46.89	54.77	62.13	77.89
Labor	12%	10.05	7.81	8.41	8.91	9.38	10.15	12.07	16.86
Warehousing		12.56	15.62	16.81	17.82	18.76	21.31	23.34	29.76
Local Tax		32.33	45.27	54.13	63.08	72.45	85.16	99.28	121.06
Importer's Price to									
Distributor		1,154	1,298	1,443	1,586	1,730	2,019	2,307	2,884
profit/bag		18.25	19.69	21.03	22.28	23.44	26.87	29.96	38.63
Trucking		22.82	24.61	26.28	27.85	29.30	33.84	38.24	49.48
Labor	7%	4.56	4.92	5.26	5.57	5.86	6.97	8.29	10.85
Warehousing		9.13	9.84	10.51	11.14	11.72	13.94	16.57	20.71
Local Tax		26.33	31.94	37.92	44.17	50.69	59.28	68.49	82.45
Distributor's Price									
to Dealer		1,235	1,389	1,544	1,697	1,851	2,160	2,469	3,086
profit/bag		20.52	32.81	36.84	36.79	40.54	47.21	54.14	69.38
Trucking	1004	61.55	41.02	36.84	45.98	40.54	47.21	54.14	69.38
Labor	10%	10.26	8.20	9.21	9.20	10.13	11.05	11.14	15.75
Local Tax		31.67	56.97	71.11	78.03	93.79	110.54	127.46	154.57
Dealer's Price to Farmer		1,359	1,528	1,698	1,867	2,036	2,376	2,716	3,394

Table 2. Sample Computation of Fertilizer Price at Various Level (Php)

To illustrate the 32% additional value (from the time the fertilizer is unloaded in Philippine ports by importers), if the import price is \$1,000, price per bag in peso (50 kgs) would be Php2,500. An additional Php75 (3%), constituting import duties, arrastre and stevedoring expenses, will be added to the import price. Successively, 12% or Php309 will be added by the importer upon selling to distributor. Another Php202 (7%) will be added by distributor to dealers. Finally, Php309 (10%) will be added by dealers upon selling to farmers. From the Php2,500 landed cost of fertilizer, the farmer would now have to buy the fertilizer at Php3,394 with the addition of transport and logistical charges from various level (Figure 1).



Figure 1. Schematic Diagram Showing the Increasing Fertilizer Price from the Landed Cost of Php2,500 to Farmer's Level

FPA-BFS Program Implementation

The FPA-BFS Technical Working Group (TWG) is created to provide policy guidance and directives in setting goals, objectives, targets and strategies for the specific projects/activities on the implementation of BFS program in the agency. The committee is composed of:

Chair:	Executive Director, FPA
Vice-Chair:	Deputy Director for Fertilizer
Members:	Division Chief, Fertilizer Regulations Division
	Division Chief, Planning, Monitoring Information Division
	Field Operations Coordination Unit
	All Regional and Provincial Officer

The TWG is responsible to coordinate and work hand-in-hand with the concerned government agencies, Regional Field Units (RFUs), State-Universities and Colleges (SUCs), local government units (LGUs), and fertilizer stakeholders (Figure 2) to ensure efficient and effective implementation of the various FPA projects in relation to BFS Program (Figure 3).

- 1. *Bureau of Soils and Water Management (BSWM)*. To implement BFS, fertility mapping, soil testing, and Chair of the BFS Program.
- 2. *Agricultural Training Institute (ATI)*. To handle training and other relevant support system on BFS.
- 3. *Bureau of Agricultural Research (BAR)*. To tackle research and Co-chair of the BFS Program.
- 4. *Bureau of Agriculture and Fisheries Standards (BAFS)*. To develop standards and registration and certification of organic fertilizer products.
- 5. *Bureau of Pant Industry (BPI)*. To develop good agricultural practices (GAP) and food safety.
- 6. *Bureau of Agricultural and Fisheries Engineering (BAFE)*. To design and inspect machineries and manufacturing plants for local fertilizers and farm systems.
- 7. *Bureau of Animal Industry (BAI)*. To do production/utilization of animal waste as organic fertilizers.
- 8. *Regional Field Units (RFUs)*. To implement the OneDA BFS Program and come up with strategies utilizing all recommendations to all crops. RFUs will likewise conduct specific and scientific researches that would benefit the Program.

- 9. *State Colleges and Universities (SCUs)*. To handle capacity building on R&E on soil science, crop production, farming systems, and Integrated Nutrient Management.
- 10. Other Concerned DA Agencies and Programs such as but not limited to Sugar Regulatory Authority (SRA), Philippine Rice Research Institute (PhilRice), National Tobacco Administration (NTA), Philippine Center for Postharvest Development and Mechanism (PhilMech), High Value Crops Development Program (HVCDP); and Agricultural Credit Policy Council (ACPC). To implement BFS strategic concerns.
- 11. *Fertilizer Stakeholders*. For public consultations and other preparatory and planning activities related to BFS Program and for relevant information as reference for project designs and development.
- 12. Local Government Units (LGUs). To implement the program.
- 13. Farmers. To adopt the Program



Figure 2. FPA-BFS Program Organizational Set Up



Figure 3. Schematic Diagram towards the Implementation of FPA-BFS Program

Organizational Structure and Terms of Reference

The FPA-BFS TWG oversees the sub-committees to ensure efficient and effective implementation of their activities.

The implementation structure of the FPA-BFS Program is composed of a Fertilizer Watch System Sub-Committee, Data Management Sub-Committee, and Extension Support, Education and Training Services Sub-Committee. The said sub-committees are composed of FPA officials/staff designated or assigned by the FPA-BFS TWG to perform the following general tasks:

- 1. Fertilizer Watch System Sub-committee
 - 1.1 *Project Rationale*. The Department of Agriculture through its "Plant, Plant, Plant Program" urges the farmers to plant more areas by providing them with quality seeds, fertilizers and appropriate technical services. In support and delivery of appropriate technical assistance regarding the provision of quality fertilizer to the farmers, the Fertilizer Watch System Project is implemented to generate, disseminate, and formulate policies concerning fertilizer regulations through systematic and integrated approach.

Generated data through this project is necessary in the planning and implementation of various projects concerning BFS Program to support farmers' access to affordable, quality and safe fertilizer products.

1.2 *Project Management*. The FPA-BFS TWG established the Fertilizer Watch System Sub-Committee to lead the Fertilizer Watch System Project. At the regional level, the FPA-Regional Field Units (RFUs) designated a Regional Project Coordinating Officer in support to the roles and responsibilities of the sub-committee. The Regional Project Coordinating Officer is designated to:

- a. Act as a Focal Person and oversee data generation in the field;
- b. Provide recommendation on how to improve the existing project;
- c. Endorse and coordinate with sub-committee regarding project proposals from the field; and
- d. Provide regular updates to sub-committee regarding the status of the implementation of the project.
- 1.3 *Coverage*. Sources for data gathering include but not limited to licensed importers, manufacturers, producers, formulators, repackers, processors, exporters, indentors, distributors, and dealers from municipal, provincial, regional and national levels.

Essential to the reporting duty of the Fertilizer Watch System Sub-Committee functions, Table 3 shows the list of FPA registered and certified agricultural fertilizer products while Table 4 shows the list of FPA registered non-traditional fertilizer products. These FPA registered products are strongly recommended for balanced fertilization to mitigate the increasing in fertilizer prices without compromising the crop yield and income of farmers.

Information such as target crops, growth stage and usage, that will be employed by farmers, will reduce dependency on inorganic fertilizers and at the same time improve productivity. Furthermore, improving soil fertility and structure is not compromised.

Table 3. FPA Registered Fertilizer Products

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Corn	15-25 days after planting (DAP)	Foliar Spray diluted by 1:1,000-2,000 times
		Corn	25-35 DAP	Additional Application as Needed
	NutriProtek ALGA 21 st	Rice	15-25 day after transplanting (DAT)	Foliar Spray diluted by 1:1,000-2,000 times
	(N=0.5%, P ₂ O ₅ =3%, K ₂ O=18%, O.M.=41.21%)	Rice	25-35 DAT	Foliar Spray diluted by 1:1,000-2,000 times
2201 R.E.N. Corporation		Leafy Vegetables	3-4 Leaf Stage (seedling stage)	Foliar Spray diluted by 1:1,000-2,000 times
		Leafy Vegetables	Repeat Application at 7-10days interval, up to 5-7days before harvest	Foliar Spray diluted by 1:1,000-2,000 times
	NutriProtek SeaHA	Corn	15-25 DAP	Foliar Spray diluted by 1:500-1,000 times
		Corn	25-35 DAP	Foliar Spray diluted by 1:500-1,000 times

3.a. Bio-Stimulant

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
	$(N=10\%, P_2O_5=1.67\%, K_2O=5\%, O.M.=8.33\%, Humic$	Rice	15-20 DAT	Foliar Spray diluted by 1:500-1,000 times
	Aciu=4.17%)	Rice	25-30 DAT	Foliar Spray diluted by 1:500-2,000 times
		Leafy Vegetables	3-4 Leaf Stage (seedling stage)	Foliar Spray diluted by 1:500-2,000 times
		Leafy Vegetables	Repeat Application at 7-10days interval, up to 5-7days before harvest	Foliar Spray diluted by 1:500-2,000 times
Bayer CropScience, Inc.	Ambition (N=8%, C=18.1%, Cl=3.2%, Amino Acids=43%, Ammoniacal N=0.7%)	Rice	Maximum Tillering and Late Booting stage	Apply at the rate of 1- 2L/ha
		Leafy Vegetables	6-8 leaf stage	225-450mL/ha or 1- 2mL/L water
		Leafy Vegetables	15-20 Days after 1st Spray	225-450mL/ha or 1- 2mL/L water
	Wokozim Yield Booster	Fruiting Vegetables	6-8 leaf stage	225-450mL/ha or 1- 2mL/L water
	Liquid (N=5.35-6.0%, Fe=0.10-0.30%, Mn=0.17-0.20%, Zn=0.06-	Fruiting Vegetables	Fruit Setting	225-450mL/ha or 1- 2mL/L water
		Fruiting Vegetables	3 weeks after 2nd Spray	225-450mL/ha or 1- 2mL/L water
	0.12 %, Cu=0.04-0.09 %, OM=8.0%min, Alginic	Cucurbits	6-8 leaf stage	225-450mL/ha.
Biostadt	Acid=1.0-1.6%)	Cucurbits	Fruit Setting	225-450mL/ha.
Inc.	Wokozim Fruit+Foliar Biostimulant	Rice	Early Panicle Initiation	225-450mL/ha.
		Rice	20-40DAT (Transplanted)	225-450mL/ha.
		Rice	40-60 DAS (Direct Seeded)	225-450mL/ha.
			Flower Initiation	
	(N=5%, K ₂ O=2%, Fe=0.5%,	Fruit Crops	Fruit Setting	1 2ml /L water
	Mn=0.25%, Cu=0.2%, B=0.25%, Alginic Acid= 0.1- 0.4%)	Fruit crops	Fruit Development	
UPL Philippines, Inc.	Pro-Set Biostimulant (N=6.2%, MgO=9%)	All Crops	35 DAT-40 DAT, 55 DAT-60DAT	Foliar spray at the rate of 1L/ha
Alltech Biotechnology Corporation	Contribute SR (Bacillus subtilis=1.8 x 10 ⁷ CFU/g, Lactic acid bacteria=2.3 x 10 ⁸ CFU/g)	Fruiting and Leafy Vegetables	Pre-plant	Apply at the rate of 0.5- 2.5kg/ha
Biostadt Philippines, Inc.	Amaze X Granules (N=0.1%, CaO=8%, SiO ₂ =25%, MgO=5%, Zn=0.05%, Alginic Acid=0.02%)	All Crops	Pre-plant and seedling stage	Apply as basal and side dress at the rate of 10- 20kg/ha (1-2 bags)

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
	Wokozim Granules Biostimulant	Sugarcane	Pre-plant and vegetative stage	Apply as basal and side dress at the rate of 60- 80kg/ha (6-8 bags)
	(N=0.13%, OM=0.39%, Fe=3%, Mn=0.004%, Cu=0.001%, Zn=0.002%, Alginic Acid=0.02%)	Other Crops	Pre-plant and vegetative stage	Apply as basal and side dress at the rate of 20- 40kg/ha (2-4 bags)
	Wokozim Power+Granular Biostimulant (N=0.1-0.5%, Fe=3.0-10.0%, Zn=0.005-1.5%, OM=0.5- 1.5%min., Alginic Acid=0.02%min.)	All Crops	Pre-plant and vegetative stage	Apply as basal and side dress at the rate of 20- 40kg/ha (2-4 bags)
Eagle Stance Enterprises	Xplorer Glory (Vesicular Arbuscular Mycorrhizae (VAM)=500 spores/g)	Fruiting and Leafy Vegetables	Prior to Sowing/Transplanting	Apply at the rate of 250g/ha in combination with inorganic fertilizer application
International Veterinary and Agrochemical, Inc.	MycoApply Endosmart (Vesicular Arbuscular Mycorrhizae≥100 spores/g)	Rice, Fruiting and Leafy Vegetables	Prior to Sowing/ 2-3 Days before Transplanting	Apply as Seed Treatment or Drench (Dapog) at the rate of 125g - 250g/ha
Sumitomo Chemical Philippines, Inc.	MycoApply® EndoSmart™ (Vesicular Arbuscular Mycorrhizae (VAM)≥100 spores/g)	Rice, Fruiting and Leafy Vegetables, Sugarcane	Prior to Sowing/ 2-3 Days before Transplanting	Apply as Seed Treatment or Drench (Dapog) at the rate of 125g - 250g/ha

3.b. Controlled Release Fertilizer

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Rice	Panicle initiation and booting stage	Foliar spray 5-6L/ha each for both stages
		Upland Cereals	Whorl stage	Foliar spray 6-12L/ha and repeat as needed
	Coron 25, 0, 0, 0, 50% Poron	Sugarcane	75-90 DAP	Foliar spray 12L/ha and repeat as needed. Higher rates can also be applied as needed.
Marubeni Philippines Corp.	Controlled Release Nitrogen	Pineapple	As practiced by plantation	Foliar spray 4-8L/ha based on plantation practice.
	(N=25%, B=0.5%)	Banana	As practiced by plantation	Foliar spray 10- 20L/ha based on plantation practice.
		Legumes	Pod Formation	Foliar spray 2-6L/ha and repeat as needed.
		Leafy Vegetables	Vegetative, thinning, or head formation	Foliar spray 2-6L/ha and repeat as needed. Use higher rate for

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
				head formation if single application.
		Root Crops	Vegetative or early tuber/bulb formation	Foliar spray 2-4L/ha and repeat as needed. Higher rates can also be applied as needed.
		Fruiting Vegetables	Vegetative, flowering, or fruiting stage	Foliar spray 2-4L/ha and repeat as needed. Use higher rates if single application at full bloom.
		Cucurbits	Vegetative, flowering, or fruiting stage	Foliar spray 2-4L/ha and repeat as needed. Use higher rates if single application at flowering.
		Citrus Fruits	Early Bloom stage	Foliar spray 4-6L/ha and repeat as needed.
		Mango	Bud break (10-18 days after flower induction)	Foliar spray solution of 500mL/200L water for every ha and repeat 7-10 days later.
		Turf Grass	As practiced by golf course	Foliar spray 10- 20L/ha based on golf course practice.
		Ornamentals	Vegetative and Pre- bloom stage	Foliar spray 2-4L/ha each for both stages.
		Drupe/Stone Fruits	Flowering	Distribute 1kg per plant into 2 holes bored into the soil near each one, then cover the hole.
Allied Botanical Corp.	Agroblen 10-7-22+2MgO Controlled (Release Fertilizer) (N=10%, P ₂ O ₅ =7%, K ₂ O=22%, MgO=2%)	Perennial Industrial Crops	Fruit Bearing	Distribute 150g per plant into 2 holes bored into the soil near each one, then cover the hole.
		Mango and Other Fruit Trees	Flowering	Distribute 1kg per plant into 2 holes bored into the soil near each one, then cover the hole.
		Oil Palm	3-5 years into growth	Distribute 750g for 3- 4-year-old trees or 1kg for 5+ year old trees per plant into 2 holes bored into the soil near each one, then cover the hole.
		Сасао	Fruit Bearing	Distribute 150g per plant into 2 holes bored into the soil near each one, then cover the hole.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Farmtech Agriland Corporation	Plantacote Supra K Controlled Release Fertilizer (N=15%, P ₂ O ₅ =7%, K ₂ O=23%MgO=2%)	Mango and Other Fruit Trees	Flowering	Evenly spread 300- 500g on cleared soil surface 10-20cm beside the stem per plant. Work the product slightly into the soil or even dig few holes 5-10cm deep.
		Perennial Industrial Crops	Bearing	Evenly spread 100- 250g on cleared soil surface 10-20cm beside the stem per plant. Work the product slightly into the soil or even dig few holes 5-10cm deep.
		Cucurbits	Bearing	Evenly spread 20-40g on cleared soil surface 10-20cm beside the stem per plant. Work the product slightly into the soil or even dig few holes 5-10cm deep.
		Fruiting Vegetables	Vegetative	Evenly spread 200- 400kg/ha on cleared soil surface. Work the product slightly into the soil or even dig few holes 5-10cm deep.
	Plantacote Pluss Controlled Release Fertilizer (N=10%, Pa0r=9%, Ka0=15%,	Container nursery stock	Vegetative	Evenly spread 3.5- 5kg/m ³ on bed or container surface.
Farmtech		Summer Bedding Ornamentals	Vegetative	Evenly spread 3- 4kg/m ³ on bed or container surface.
Corporation	MgO=2%, B=0.030%, Cu=0.015%, Fe=0.400%, Mn=0.100%, Mo=0.020%,	Indoor Plants	Vegetative	Evenly spread 4.5- 5.5kg/m ³ on bed or container surface.
	Zn=0.050%)	Ornamental Cut Flowers	Vegetative	Evenly spread 80- 100g/m ² on bed or container surface.
Nutriquest International, Inc.	Nutri Q Nutricote Controlled Release 18-6-8 (N=18%, P ₂ O ₅ =6%, K ₂ O=8%)	Mango and Other Fruits	Transplanting	Applied once per season at the rate of 100g-150g/plant.
Ramgo international Corporation	Nutricote 13-11- 11+2MgO+TE Controlled Release (N=13%, P ₂ O ₅ =11%, K ₂ O=11%, MgO=2%, Cu=0.02%, Fe=0.20%, Mn=0.06%, B=0.02%)	Perennial Industrial Crops	1 month after transplanting	Evenly divide 150g into the 4 holes 3-6 inches deep and 1 foot away for each tree. Apply once per season.

3.c. Foliar Fertilizer

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
3MC Bio-Tech	3MC Agri-Need Liquid	Rice	Starts at 20 DAT	Foliar spray at the rate of 100mL/16L water. Repeat at 20 days interval.
Alah Marketing Campaign	Foliar Fertilizer (N=1.23%, P ₂ O ₅ =0.35%,	Corn	1 week before tasseling	Foliar spray at the rate of 100mL/16L water.
Services	K ₂ O=2.94%)	Potato	5-10 days after emergence (DAE)	Foliar spray at the rate of 100mL/16L water.
		Citrus/Man go	Prior to bloom	Foliar spray at the rate of 100mL/16L water.
Abcris Enterprises	California Growers Foliar (N=3.35%, P205=0.25%,	Rice	2 weeks into growth	Apply once every 4 days for 12 consecutive days, then once weekly until harvest or as needed at 3 tbsp/gallon of water.
	K ₂ O=0.60%)	Tomato	pre-development until active stage	Once weekly at 3 tbsp/gallon of water.
		Banana	any stage	once every 15 days at 3 tbsp/gallon of water.
Agchem Manufacturing Corporation	Xtra-Gro Foliar Fertilizer (N=5%, P_2O_5 =1.9%, K_2O =4%)	All Crops	2 weeks after planting	spray, drench or fertigate 8-10 tbsp /16L of water. Repeat after 7-14 days.
Agribenz Marketing	Redeemer Foliar Inorganic (N=0.01%, Ca=6%, Mg=82.1ppm)	Tomato	30 DAT	Foliar spray at the rate of 4 tbsp/16L water.
Agrigrowth International Corporation	AIC Imperium-Xplus Liquid Foliar (N≥9%w/w, P ₂ O ₅ ≥7.0%w/w, K ₂ O≥7.0%w/w, Cu≥0.00040%w/w, B≥0.00010%w/w, Fe≥0.04%w/w, Zn≥0.0014%w/w, Mn=≥0.00056%w/w, Humic Acid≥13.0%w/w)	Fruiting and Leafy Vegetables	10-15 DAT	Foliar spray at the rate of 10-20mL/16L water.
Agrivesta Industrial Corporation	Vestagold Foliar Fertilizer (N=5%, P ₂ O ₅ =1.9%, K ₂ O=4%)	All Crops	2 weeks after planting	spray, drench or fertigate 8-10 tbsp/16L of water. Repeat after 7-14 days.
Agrotiger		Rice	15 DAE, 15 DAT	Foliar spray at the rate of 40-60mL/16L water.
Phils., Corporation	Hyfer Plus Foliar (N=22%, P ₂ O ₅ =11%, K ₂ O=9%)	Fruiting and Leafy Vegetables	15 DAE, 15 DAT	Foliar spray at the rate of 40-60mL /16L water.
A.G. Tolentino Agri Marketing	Pro Bio Foliar Fertilizer (N=11.51%, $P_2O_5=6\%$, $K_2O=9.49\%$)	Rice	30 days after seeding/DAT	apply at 6 tbsp/16L water then reapply 2 other times at 20-day intervals.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Cebu Eaglechem	Mega Yield Multi Crop Foliar (N=2.39%, P205=3%,	Sweet Corn	Pre-plant	Seed soaking using dilution rate of 500mL/1 Gallon of water.
Traunig	K ₂ 0=3.74%)		15 DAS, 30 DAS	Foliar spray at the rate of 8 tbsp /16L water.
Central Luzon State	Rich NK Foliar (N=2.66%, P ₂ O ₅ =1.6%, K ₂ O=4.78%)	Tomato	15 DAT	Foliar spray at the rate of 40mL/16L water, repeat weekly.
University	Moringa Foliar (N=12.81%, $P_2O_5=0.06\%$, $K_2O=8.56\%$)	All Crops	15 DAT	Foliar spray at the rate of 240mL/16L water, repeat weekly.
	Piomata Forta Liquid	Leafy Vegetables	Vegetative and Fruiting	Foliar spray at the rate of 6-10 tbsp/16L water.
Chomroz	Foliar $(N=5.63\% P_2O_7=4.26\%)$	Fruiting Vegetables	Vegetative and Fruiting	Foliar spray at the rate of 3 tbsp/16L water.
Technologies,	$K_2O=6.41\%$, S=0.5%, Mg=0.29%, Ca=0.28%,	Rice	Vegetative and Fruiting	Foliar spray at the rate of 3 tbsp / 16 L water.
IIIC.	Fe=0.14%, Mn=0.02%, Mo=0.0002%, Cu=0.017%,	Sugarcane	Vegetative	Foliar spray at the rate of 16 tbsp/16L water.
	E11-0.1170J	Mango	Fruiting	Foliar spray at the rate of 2-7 tbsp/6L water.
Corvill	Standout Foliar (N=10.%, K ₂ O=10%, SiO ₂ =20.32%, B=0.10%, Mo=0.01%)	Fruiting Vegetables	Fruit setting until the end of crop cycle	Foliar spray at the rate of 40-50mL/16L water. 7-10days interval.
Agricom, Inc.		Leafy Vegetables	4-6 leaf stage	Foliar spray at the rate of 40-50mL/16 L water. 7-10days interval.
Digmar Agricultural Technology & Services	Vigor Plus Foliar (N=4.5%w/w, P ₂ O ₅ =2.17%w/w, K ₂ O=4.54%)	Rice	7 DAT, Reproductive stage	Foliar spray at the rate of 12-16 tbsp/16L water.
Domirflex Agricultural Products	Green Pasture Foliar (N=17%, P ₂ O ₅ =6%, K ₂ O=8%, Zn=13ppm, Fe=528ppm, Mn=69ppm, B=4ppm)	Rice	13-63 DAT	Foliar spray at 100mL/16L water at 13-16 DAT, repeat at 23-25 DAT, 43-45 DAT, and 60-63 DAT.
		Upland Cereals	14-44 days after planting (DAP)	Foliar spray at 100mL/16L water at 14-15 DAP, repeat at 21-22 DAP, 28-29 DAP, 35-36 DAP, and 43-44 DAP.
		Fruiting and Leafy Vegetables	Vegetative	Foliar spray at 60mL/16L water. Repeat as needed at 5 days interval.
		Sugarcane	30-31 DAP	Foliar spray at 100mL/16L water. Repeat dosage every 15 days until 6 months.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Mango	13-55 days after flower induction (DAFI)	Foliar spray at 1L/drum of water at 13-20 DAFI, repeat at 21-26 DAFI, 33-38 DAFI, 40-45 DAFI, and 50-55 DAFI.
		Banana	30-35 DAP	Foliar spray at 100mL/16L water. Repeat dosage every 15 days until 6 months.
ENLASA Phils., Inc.	Agritop Foliar $(N=7.5\%, P_2O_5=8.2\%, K_2O=9.6\%, Mg=0.52\%, Ca=1.2\%, S=0.11\%, Fe=0.15\%, Mn=0.24\%, Cu=0.09\%, Zn=0.14\%, B=0.03\%, Mo=0.03\%)$	Rice and Upland Cereals	21-28 days after seeding or 14-21 DAT	Foliar spray 80mL/16L water with repeat applications up to 4 per season at intervals of 2 weeks.
	Pegador pH Foliar (P ₂ O ₅ =27%)	Pechay and Banana	Vegetative	Foliar spray 1-2L/ha with sufficient water.
Enortesh	Alpha Grow 11-7-6 NPK Foliar (N=11%, P ₂ O ₅ =7%, K ₂ O=6%, Bo=0.1%, Cu=0.007%, Mn=0.01%, Mo=0.001, Zn=0.005%)	Perennial Industrial Crops	Early Growth Stage	Foliar Spray or drench solution of 2-4mL/L of water. Repeat as needed at 14-day interval.
		Rice	Panicle initiation of early booting	Foliar Spray solution of 30-50mL/16L of water. Do not spray at both stages.
		Root Crops, Upland Cereals, Legumes, and Fruiting and Leafy Vegetables	Early Growth Stage	Foliar Spray or drench solution of 30- 50mL/16L of water twice at 14 days interval.
Corporation		Mango	Full bloom	Foliar Spray solution of 400-600mL/200L once before full bloom. Repeat as needed at 14 days interval.
		Citrus Trees	Before blossoming	Foliar Spray or drench solution of 30- 50mL/16L of water first before blossom and the 2nd after fruit formation.
		Ornamental s	as practiced by nursery	Use as needed when growth has stopped with interval of reapplication of 14 days.
Good Earth Technologies International, Inc.	Florida Green Gold Foliar (N=4%, P ₂ O ₅ =3%, K ₂ O=3%)	Tobacco, Rice, Corn, and Okra	Vegetative	Foliar Spray solution of 150-200mL/16L of water into leaves. Repeat as needed at intervals of 10-14 days,

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
				7 under stressful condition.
Intelligrow Agri products	Gro Plant Booster Foliar (N=0.30%, $P_2O_5=0.01\%$, $K_2O=2.18\%$)	Rice, Upland Cereals, and Fruiting and Leafy Vegetables	25 days after planting	Foliar spray 350mL/ha with sufficient water. Repeat applications up to 2 times every 15 days.
		Mango	20-50 days after flower induction	Foliar spray 150- 250mL/200L water. Repeat at 35 and 50 DAFI.
		Fruiting and Leafy Vegetables	flowering stage	Foliar spray 2-3L/ha diluted at 80- 100mL/16L water. Repeat up to 6-7 applications at 15 days interval.
	Omex Bio 20 Foliar (N=20%w/v, P2O5=20%w/v, K2O=20%w/v, Mg=1.5%w/v, B=0.029%w/v, Fe=0.146%w/v, Cu=0.06%w/v, Mn=0.073%w/v, Zn=0.073%w/v)	Mango	20-75 days after flower induction	Foliar spray 250- 500mL/100L per ha diluted at 40- 80mL/16L water. Repeat as needed at 15 days interval.
Distribution, Inc.		Rice	Panicle initiation and soft booting stage	Foliar spray 1.5- 3.5L/ha diluted at 50- 100mL/16L water each for both stages
		Fruiting and Leafy Vegetables	Seedling stage	Foliar spray 2-3L/ha diluted at 110- 120mL/16L water. Repeat up to 2-3 applications at 14 days interval
		Upland Cereals	1 month after planting	Foliar spray 1.25- 2.5L/ha diluted at 50- 100mL/16L water.
	Metalosate Multimineral	Fruiting Vegetables	Fruiting	Foliar spray 250- 500mL/ha diluted at 20-40mL/16L water. Repeat at least 3-4 times at 10 days interval.
JOCANIMA Corporation	Metalosate Multimineral Foliar (Ca=1%, Mg=1%, Fe=0.5%, Cu=0.5%, Mn=0.5%, Zn=0.5%, Mo=0.1%)	Leafy Vegetables	45 days after planting or head formation	Foliar spray 500mL/ha diluted at 40mL/16L water. Repeat 1-2 times at 10 days interval.
		Upland Cereals	8-10 leaf stage	Foliar spray 500- 750mL/ha diluted at 40-60mL/16L water. Repeat 1-2 times at 10 days interval.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Mango	45-80 days after flower induction	Foliar spray at 50- 100mL/200L water first at 45-55 DAFI and the 2nd at 75-80 DAFI.
	Metalosate Zinc Foliar (Zn=6.8%)	Banana	Vegetative and Reproductive stages	Foliar spray at 250- 500mL/ha at monthly intervals. Higher rates are recommended during Zinc deficiency.
	Metalosate Crop-Up Liquid Foliar (Mn=2.5%, Zn=1.25%,	Banana	period of nutritional stress during cropping season	Applied at 280- 500mL/ha during periods of stress repeated 2 or more times at 4-week intervals.
	Mg=0.5%, Cu=0.19%, Fe=0.25%, B=0.025%)	Potato	15, 30 and 45 Days after emergence	Applied at the rate of 500mL/ha or 4 tbsp/16L of water.
		Rice	Before planting, basal, and top dress	Foliar spray 100mL 3 days before planting, 100mL one week after side dress or basal, and 150mL one week after top dress.
M.Borja Agri- Trading	VV Plus Foliar Inorganic (N=3.25%, P ₂ O ₅ =3.36%, K ₂ O=3.07%)	Root Crops	Sowing and transplanting	Foliar spray 50mL 3 days before sowing, repeat after 15 days. Spray 80 mL 15 days after transplanting and reapply 50mL during irrigation.
		Fruiting and Leafy Vegetables	Sowing and transplanting	Foliar spray 60mL 3 days before sowing, repeat after 15 days. Spray 50 mL 15 days after transplanting and reapply 50mL during irrigation.
		Fruiting and Leafy Vegetables	20 days after planting	Foliar spray 20- 40g/16L of water every 7-10 days.
		Legumes	25-35 days after planting	Foliar spray 20- 40g/16L of water every 7-10 days.
Mawada Fertilizer Manufacturing	Mawada Foliar Inorganic (N=29.92%, K ₂ O=21.13%, Ca=19ppm)	Root Crops	25-35 days after planting	Foliar spray 20- 40g/16L of water every 7-10 days for 5 times.
		Fruit Trees	Budding stage	Foliar spray 20- 40g/16L of water.
	Orna	Ornamental s	Before blossoming	Foliar spray 20- 40g/16L of water twice a month.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Mepgem Agro Chemical	SOB Formula Foliar Plus Fertilizer (N=0.47%, K ₂ O=3.39%, CaO=46.26%, MgO=0.35%, Cu=10ppm, Zn=1236ppm, Mn=17.45ppm, Fe=223ppm)	Rice	10 days after transplanting up to milking stage	Foliar spray at 3-4 tbsp/16L water. Repeat as needed at 10 days interval.
Michael Carlo Fertilizer	Growbest Reproductive Foliar (N=6%, P ₂ O ₅ =1.17%, K ₂ O=7.30%)	Leafy Vegetables	5-7 days after sowing	Foliar spray diluted solution of 6-8 tbsp/16L of water onto leaves and roots. Repeat as needed every 5-7 days.
Industry	Growbest Vegetative Foliar Fertilizer (N=5.82%, P_2O_5 =1.44%, K_2O =5.92%)	Leafy Vegetables	5-7 days after sowing	Foliar spray or drench at 6-8 tbsp/16L water onto leaves and roots. Repeat as needed every 5-7 days.
Norte Agila Corporation	APG Foliar Fertilizer (P ₂ O ₅ =0.01%, K ₂ O=0.07%, S=37.38%)	Leafy Vegetables	Vegetative stage	Foliar spray at 2-3 tbsp/16L water. Repeat as needed at 7-15 days interval.
Now Win Resources and Trading	Sun Green Foliar (SiO ₃ =10%)	Upland Cereals	30 days after transplanting and flowering	Foliar spray at 4 tbsp/16L water. Repeat as needed after 10 days. Spray at 8tbsp/16L water as final application during flowering.
		Rice	Start spraying 1-2 weeks after transplanting	100mL/16L water, repeat application every 2 weeks.
Oria Agrotech, Inc.	Aldrimax Foliar (N=4.16%, P ₂ O ₅ =1.74%, K ₂ O=1.78%)	Pechay	Start spraying 12 weeks after transplanting, start spraying when 3-4 leaf appears (broadcast seedling)	60mL/16L water, repeat on a weekly application until 1 week before harvest.
Philippine Nuclear	Carrageenan Foliar (K ₂ 0=933ppm, Ca=24.8ppm, Cu=4.6ppm_Mg0=26.7ppm	Rice	1: 12-14 DAT 2: 30-35 DAT 3: 45-50 DAT	20mL/L water
Research Institute	Fe=2.7ppm, Total Dissolved Solids=5500ppm)	Mungbean, Soybean & Peanut	1: 7-10 DAE 2: 20-25 DAE 3: 30-40 DAE	10mL/L water
		Rice	Spray 2 weeks after planting & 15 days thereafter	8-10 tbsp/16L of water.
PMC Enterprises	Bounty Grow Foliar	Corn	Spray 2 weeks after planting & 15 days thereafter	8-10 tbsp/16L of water.
2	$K_20=5.13\%$	Banana	Spray every 15 days interval after planting	Mix 1L/drum of water
		Рарауа	Spray every 15 days interval after planting	Mix 1L/drum of water

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Pomelo	Spray weekly after planting	8-10 tbsp/16L of water.
		Mango	Spray weekly after planting	Mix 1L/drum of water
		Ornamental s	Spray weekly after planting	8-10 tbsp/16L of water.
		Asparagus and other Vegetables	Spray weekly after planting	Mix 8-10 tbsp/16L of water or 1L/drum.
		Pechay	Spray every 5-7 days after planting	8-10 tbsp/16L of water.
Rev Enterprises	Happy Harvest Liquid Foliar (N=3.36%, P ₂ O ₅ =0.167%, K ₂ O=2.65%)	Rice	Spray 2 weeks after planting & 15 days thereafter	8-10 tablespoon/16L of water.
		Banana	spray every 5-7 days after planting	100mL/16L water
		Rice	every month after planting	
		Corn	every month after planting	
		Sugarcane	every 2 months after planting	
		Pineapple	every 2 months after planting	
Richfund International	Prime EC Foliar Liquid	Banana	every month after planting	100mL/16L water
Co., Ltd.	(N=5%, P ₂ O ₅ =5%, K ₂ O=4%)	Vegetables	every 2-3 weeks after planting	1000mL/ha
		Leafy Vegetables	every 2-3 weeks after planting	
		Fruit trees	every month after planting	
		Root crops	every 2 weeks after planting	
		Flowers	every 2 weeks planting	
		Carrots	25-35 days after	
		Radish	planting	
		Cabbage Strawberry	20 days after planting	
		Potato	20-35 days after planting	
Sotelo Fertilizer	Go Rich Foliar	Sweet Peas	25-35 days after	
Manufacturing	(N=20%,K ₂ O=35%)	All kinds of	planting	20-40g
		Fruit bearing Trees	Application start at budding stage	(2-4 tbsp)/16L of water, apply 7-10 days interval.
		All kinds of Ornamental Plants	Apply before blossom, Twice a month	
Stoller Philippines, Inc.	Flower Power Foliar (B=3%, Cu-0.1%, Mo=0.002%, Zn=4%)	Mango	1st application: 20-25 days after flower induction 2nd application: 26-32	200mL/200mL water

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
			days after flower induction	
		Rice	Start application 20 days after transplanting	100mL/16L water, repeat as 20 days interval.
		Corn	Apply one week before tasseling and 10-14 days interval	100mL/16L water
	Top Yield Systemic Liquid	Potatoes	Apply one after emergence and 10-14 days interval	100mL/16L water
Toplander Global Trading	Foliar (N=1.23%, P ₂ O ₅ =0.35%,	Citrus/Man go	Prior to bloom and 10- 14 days interval	100mL/16L water
	K ₂ 0=2.94%)	Beans	When pods fill up and 10-14 days interval	60mL/16L water
		Tomato	During plant grow and 10-14 days interval	60mL/16L water
		Eggplant	Spray foliage to wet just before bloom and 10- 14 days interval	60mL/16L water
		Onion/Garli c	During plant growth and 10-14 days interval	100mL/16L water
		Mango	Spray once before blossom	2.5-5.0 L/ha, repeat application 3-5 times at 7-10 days interval.
		Rice	Apply only once at either panicle initiation or early booting	2.5-5.0L/ha
		MangoSpray once bet blossomRiceApply only ond either panicle ini or early bootiCornSpray 4 times sta at 15-25cm plant at 14 days intePotatoes,Initial particular	Spray 4 times starting at 15-25cm plant height at 14 days interval	5.0-10.0L/ha
	Green World Foliar Fertilizer (N=11%, P ₂ O ₅ =8%, K ₂ O=6%)	Potatoes, Carrots, Radish, Beets and Cassava	Apply 3 weeks after emergence or before flowering	4.0-6.0L/ha, application through foliar spray drenching. Repeat application 3-5 times at 7-10 days interval.
Trans World Trading Co., Inc.		Sitao, Mungbean, Beans	Spray once any time before flowering	4.0-6.0L/ha, repeat application 3-5 times at 7-10 days interval or as needed.
		Cabbage, Broccoli, Cauliflower, Pechay	Begin as 3rd or 4th leaf begins to form	4.0-6.0L/ha, apply 3-5 times at 7-10 days interval.
		Tomatoes, Eggplants, Bell Pepper, Chili pepper	Spray once any time before flowering	4.0-6.0L/ha, repeat application 3-5 times at 7-10 days interval or as needed.
		Onion, Garlic, Leeks	Apply 3 weeks after emergence or before flowering	2.5-5.0L/ha, application through foliar spray drenching, repeat 3-5 times at 7-10 days interval.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Ampalaya and Cucumber	Spray once any time before flowering	4.0-6.0L/ha, repeat 3-5 times application at 7- 10 days interval or as needed.
		Watermelo n and melons	Spray once any time before flowering	5.0-10.0L/ha, repeat application 3-5 times at 7-10 days interval or as needed.
		Calamansi, Pomelo	Spray once before blossom	2.0-5.0L/ha, repeat application 3-5 times at 7-10 days interval.
Vann Hawk	Grower's Gold 30-10-10	Fruit Trees & dates palm	During flowering and fruit development	75-100g/tree/week
Chemicals, Inc.	(N=30%, P ₂ O ₅ =10%, K ₂ O=10%)	Forage Crops: Turf	Apply 10 days after each cut as the need arises	2-5kg/ha 10-20g/m²
		Cutflower & other ornamental s	15 DAE and 7-14 days interval	1 tbsp/16L
		Rice Direct Seeding, Transplanted	Seed soaking 15 DAE and 7-14 days interval. Seed soaking 7 DAT and 7-14 days interval	1 tbsp/16L
		Corn	Seed soaking 7 DAE and 7-14 days interval	1 tbsp/16L
		Pineapple	During Vegetative Stage and 7-14 days interval	1 tbsp/16L
Yovel Fast	Treelizer liquid Foliar	Tobacco	7 DAT and 7-14 days interval	1 tbsp/16L
Research and Development	$(N=2\%, P_2O_5=1.28\%, N=0.207$	Banana	21 DAP and 15 days interval	2 tbsp/16L
Inc.	$R_20=3.86\%$, Mg0=39.7 ppm, Zn=186.6ppm, pH=13.28)	Mango	21 DAP and 15 days interval	2 tbsp/16L
		Durian	21 DAP and 15 days interval	2 tbsp/16L
		Citrus	21 DAP and 15 days interval	2 tbsp/16L
		Papaya	21 DAP and 15 days interval	2 tbsp/16L
		Sugarcane	7 DAE (continue spraying up to 4 months) and 15 days interval	2 tbsp/16L
		Tomato, Chili, Pepper, Eggplant, Okra	Seed soaking, 7 DAE and 7-14 days interval	1 tbsp/16L

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
		Cabbage, Pechay, Lettuce, & other Leafy Vegetables	Seed soaking, 7 DAE and 7 days interval	1 tbsp/16L
		Upo Watermelon, Cucumber, Ampalaya, Squash	Seed soaking, 7 days after emergence and 7-14 days interval	1 tbsp/16L 2 tbsp/16L
		Grapes	Seed soaking, 7 DAE and 7-14 days interval	1 tbsp/16L
		Cassava, Sweetpotat o, Onion, Ginger & Other Root Crops	7 DAE and 15 days interval	1 tbsp/16L
Zetryl.Chem Phils., Inc.	Kendal Liquid Foliar (N=3.5%, K20=15.5%, Organic Carbon=3%)	Pechay	Vegetative	Foliar Application: 1.5-3L/ha or 150- 300mL/100L Fertigation Application: 7.5-10L/ha.

3.d. Inoculant

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
EM. 1 Microbial Ind		Potato, Tomato, Cabbage, Lettuce, Rice and Onion	Pre-plant	Drench or spray on the Soil at the rate of 1L/ 500L of water.
	EM. 1 Microbial Inoculant	Potato, Tomato, Cabbage, Lettuce, Rice and Onion	Pre-plant	Soak the seeds using the dilution rate of 1- part EM1: 1,000 parts water.
EM Research Phils., Inc.	(Lactic Acid Bacteria=1.77x10 ⁶ cfu/ml)	Rice	40 DAT, 90 DAT	Spray at the rate of 20L/ha.
		Cabbage, Lettuce, Potato	20 DAP, 40 DAP	Drench at the rate of 20L/ha.
		Onion	20 DAP, 40 DAP, 60 DAP, 100 DAP, 120 DAP	Drench at the rate of 20L/ha.
		Tomato	20 DAT, 40 DAT, 60 DAT, 100 DAT, 120 DAT	Drench at the rate of 20L/ha.
Aldia Inc	Avatar Bio Inoculant Fertilizer	Rice	Seed Treatment/Before Planting	Mix 1 sachet/45kg Seed.
Aluiz, IIIC.		Corn	Seed Treatment/Before Planting	Mix 1sachet/20kg Seed

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
	(Trichoderma sp.=1x10 ⁹ CFU/g)	Sugarcane	Cane points treatment	Dissolve 2 sachets/200L water.
Arnichem Corporation	nichem poration $Vital N Microbial Inoculant(N=0.888%, P_2O_5=0.033%,K_2O=0.19%, Azospirillumspp.=1.18 x 105 cfu/g)$	Rice, Corn, and Celery	Seedling before planting	Applied by drenching at the rate of 100g/0.3L to 8L water or by spraying at the rate of 100g/16L water.
		Rice, Corn	Seed Treatment/Before Planting	Mix 100g/20kg of Corn or Rice seeds.

3.e. Plant Growth Regulator

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Agspec Philippines Corp.	Flupro 14 EC Plant Growth Regulator (Flumetralin=13.7%)	Tobacco	Elongated button to early flowering stage within 4 hours of topping	Spray at 1-2L/100L water or 10-15mL of diluted solution per plant within 24 hrs after topping.
Rotam Philippines	Jester 25 SC Plant Growth Promoter (Paclobutrazol=250g/L)	Mango	1 month after flushing or 3-5 months before target flowering	Drench at 4mL x canopy diameter (m) diluted in 3-5L of water.
Stoller Philippines, Inc.	N-Large Plant Growth Promoter	Banana	3 weeks into fruiting or before bagging	Spray 120mL of solution diluted at 10mL/L of water at the lower hands (from 5th hands and below) or spray 12 sprayer tanks/ha.
Stoller Philippines, Inc.	(GA3=4%)	Pineapple	14-16 weeks after forcing or induction	Spray 12 sprayer tanks of solution diluted at 8- 9L/1,800-2,400L of water/ha.

3.f. Soil Conditioner

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Oracle Chem Corporation	Zap Soil Conditioner (N=8%, S=1%, Fe=0.10%, Mn=0.05%, Zn=0.05%)	Legumes	15-20 days before planting, bud, break, root flush or at the onset of dormancy	Foliar spray at the rate of 50-60mL/16L water or 5L/ha.
Ramgo International Corp	Humarich (Humic Acid=87.5%, K ₂ 0= 12.1%, Organic Matter=80%)	Fruiting and leafy vegetables	Foliar Application: after transplanting apply every 2-10 days from bud burst to fruiting period Soil Application: before planting	Foliar Application: Dilute 3-5g/L water or 50-80g per 16L water. spray on the Soil Application: 50- 70g/100sqm or 5-7 kg/ha. Apply alone or with NPK fertilizers application.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Sagrex Corporation	Grow More Liquid Chelated Humus (Humic Acid=12%)	Rice	Broadcast Application: foliar spray on soil surface prior to planting. Spray on young plant	Broadcast Application: spray on soil surface prior to planting at the rate of 4L/ha. Can be applied in combination with liquid fertilizer. Transplanted Rice: spray at the rate of 2L/ha in conjunction with fertilizer application.
		Rice	Broadcasting at sowing or planting (basal application)	
	Golden Bright Agri	Sugarcane	Broadcasting at sowing or planting (basal application)	1st Application: 3
Golden Bright Agri Trading	Soil Conditioner	Corn	Broadcasting at sowing or planting (basal application)	bags/ha. 2nd Application: 4-5 bags/ha. 3rd Application: 2-3
	(Ca=36%, P ₂ O ₅ =4%)	Vegetables	Broadcasting at sowing or planting (basal application)	bags/ha.
		Ornamental Plants	Broadcasting at sowing or planting (basal application)	
Goldenman Marketing Corporation	Humix Gold WSP (K ₂ 0=12%, Humic acid=95%, Organic matter=50%, Total carbon=29%)	Pechay	Basal prior to planting, then you may follow up 3-4 times throughout the growing season	Dry mix with Granular Fertilizers - Mix 0.50- 1.0kg per bag of NPK fertilizer (50kg). Apply as basal, top-dress, or side- dress methods. Soil spray or Soil Drench - Dissolve 3 to 6 tbsp per 16 L water. Apply directly to the soil. Foliar spray - Dissolve 2 to 3 tbsp per 16L water.
Green Thumb Exfert Ventures, Inc.	GT Humic WSP (K ₂ O=12%, Humic acid=95%, Organic matter=50%, Total carbon=29%)	Pechay	Basal prior to planting, then follow up 3-4 times application throughout the growing season	Dry mix with Granular Fertilizers - Mix 0.50- 1.0kg per bag of NPK fertilizer (50kg). Apply as basal, top-dress, or side- dress methods Soil spray or Soil Drench - Dissolve 3 to 6 tbsp per 16L water. Apply directly to the soil. Foliar spray - Dissolve 2 to 3 tbsp per 16L water.

COMPANY NAME	PRODUCT NAME (GUARANTEED ANALYSIS)	TARGET CROP/S	GROWTH STAGE	DIRECTION FOR USE
Society Agri Venture Enterprises, Inc	BioHealth TH WSG (Trichoderma Harzianum=1x10 ⁷ CFU/g, Humic Acid=56.9%)	Pechay and Banana	Soil drench before transplanting of seedlings and every 7 days	Dilute 2 kg of Biohealth Th WSG in 200L of water. BioHealth TH WSG Soil Conditioner can be applied alone or in combination with inorganic fertilizer
Systemic Farm Chemicals I	Humax Humic Acid=80%	All Crops	Vegetative and as needed	Foliar spray at the rate of 1 tbsp/16L of water every two weeks. Applied to the soil by mixing 100 g of HUMAX in every 50 kg of inorganic fertilizer
VPO Rosario Agro industrial Development Corporation	VPO Fortified Soil Conditioner (N=6.70%, $P_2O_5=0.45\%$, $K_2O=0.82\%$)	All Crops	Pre-plant	Apply at the rate of 15-20 bags/ha.
	Combustion Ash ($P_2O_5=19\%$, $K_2O=19\%$,	Rice	Basal (Land Preparation before levelling) and 30-45 days after planting (DAP)	Basally apply 25kg mixed with 50kg urea/ha. Planting may be done 7- 14 days after application of the mixture to soil. Reapply 12.5kg mixed with 50kg urea/ha at 30 DAP, then 12.5 kg unmixed at 45 DAP.
WRM Agri-Organika Phils., Inc.	MgO=3.9%, CaO=16%, S=3.8%, Zn=0.3%, Mn=0.32%, Fe=0.5%, SiO ₂ =2.7%, B=276.5ppm, Cu=529ppm)	Fruiting and Leafy Vegetables	Basal (Land Preparation before levelling) and onset of flowering and fruiting	Basally apply 25kg mixed with 50kg urea/ha. Planting may be done 7- 10 days after application of the mixture to soil. Reapply 10g per hill or plant at onset of flowering, then apply 10g urea at 5 days after this. Apply 10g per hill or plant at onset of fruits, if applicable.

Table 4. FPA Registered Non-Traditional Fertilizer Products

4.a. Bio-stimulant

COMPANY	PRODUCT NAME	TRIAL	TIME AND DOSAGE OF	YIELD DATA
NAME	/GUARANTEED ANALYSIS	CROPS	APPLICATION	
Magan Agro Phils. Enterprise, Inc.	Empower/ Bacillus amyloliquefaciens=2x10 ¹² cfu/l, SiO ₂ =6%, CaO=4.2%, MgO=1%	Cabbage	Spray seedlings 4-7 DBT; Spray plants at 15, 30, and 45 DAT/ 4 t/ha Chicken Manure (CM) plus 240-90-90 NPK/ha plus A1 Empower at 50mL /16L of water	39.18 t/ha

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
LEADS Agricultural Products Corporation	Biosol AL Y1336/ Bacillus subtilis=1 x 10 ¹² cfu/l	Potato	Split application, half dose at planting as basal, remaining half amount applied as side dressing 15 DAP; Apply CM one time before planting/	20.45 t/ha
		Cabbage	4 t/ha CM + recommended NPK/ha + 3L/ha of Biosol AL Y1336	39.75t/ha
Corporation	Biobac WP Y1336/ Bacillus subtilis=1 x 10 ¹³ cfu/kg	Potato	Split application, half dose at planting as basal, remaining half amount applied as side dressing 15 DAP; Apply CM one time before planting/ 4 t/ha CM plus 140-140- 140 NPK/ha plus 3L/ha Biosol AL Y1336	20.45 t/ha
	Agriful/ N=4.5%, P ₂ O ₅ =1%, K ₂ O=1%, Humic Extract=25%, Fulvic Acid=20%	Tomato	Application will be done 7 (seven) times within the growing period starting at 15 DAT and every 10 days thereafter until the 75th DAT/ Application of chemical fertilizer at full recommended rate plus Agriful at 5L/ha per 16L of tankload of water	14.25 t/ha
		Lettuce	Vegetative stage at 15 and 30 DAT/ Recommended rate of NPK fertilizer based on soil analysis combined with Maxilizer Liquid foliar sprayed at 500mL/ha	12.02t/ha
Indofil Philippines, inc.	Maxilizer Liquid/ N=1%, Zn=0.2%, B=0.2%, Amino acid=8%, Organic matter=12%, Humic acid=7%, Cytokinin activity=10µg/l,	Rice	Tillering and flowering stages/ Recommended rate of NPK fertilizer based on soil analysis combined with Maxilizer Liquid foliar sprayed at 500mL/ha	4.89 t/ha
	Gibberellin activity=/μg/l, Gibberellin activity=5μg/l	Tomato	Vegetative, flowering, and fruiting stage/ Recommended rate of NPK fertilizer based on soil analysis combined with Maxilizer Liquid foliar sprayed at 250mL/ha	23.03kg
		Mango	25, 50, and 75 DAFI/ Recommended rate of NPK fertilizer based on soil analysis combined with	4.12kg marketable fruits

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
			Maxilizer Liquid foliar sprayed at 500mL/ha	
	Maxilizer Granules/ N=0.04%, Zn=50ppm, Amino acid=0.15%, Organic matter=1%, Humic acid=1%,	Rice	Vegetative stage/ Recommended rate of NPK fertilizer based on soil analysis combined with Maxilizer Granules foliar sprayed at 20kg/ha	5.06t/ha
	Cytokinin activity=0.3µg/l, Auxin activity=0.5µg/l, Gibberellin activity=0.25µg/l	Tomato	Vegetative stage at 0 and 20 DAT/ Recommended rate of NPK fertilizer based on soil analysis combined with Maxilizer Granules foliar sprayed at 10kg/ha	22.44kg
Sumitomo Chemical Philippines, Inc.	Smartfoil/ Fulvic Acid=26.1%	Banana	4 MAP/ SmartFoil alone sprayed at 2L/ha	8.9 average number of hands/bunches
Con CBM Microor Biotechnology Meso Products, Inc. Bacteri	Complex Beneficial Microorganism (CBM) Liquid Based/ Mesophilic Lactic Acid	Rice	1 day before transplanting, and 15, 30, and 45 DAT/ 120-60-30kg/ha NPK fertilizer combined with 1L CBM/200L water foliar sprayed	8.07t/ha
	Bacteria=6.5 x 10 ⁴ CFU/ml	Tomato	1 day before transplanting, and 15, 30, and 60 DAT/ 1L CBM/200L water foliar sprayed	6.84t/ha
Advanced Agrisolutions Philippines Corporation	Mantus/ Cu=20%, Polyphenols (Organic Carbon) =9.8%	Pak Choi	10 and 20 DAT/ 100-30-30 kg NPK/ha plus 0.50L/ha rate	19.50 t/ha
Alltech Biotechnology Corporation	Contribute SR/ Bacillus subtilis=1.8 x 10 ⁷ CFU/g, Lactic acid bacteria=2.3 x 10 ⁸ CFU/g	Lettuce	Vegetative stage at 0 and 14 DAT/ Recommended rate of NPK fertilizer based on soil analysis combined with 3kg Contribute SR/ha sprayed foliar and basally	10.63t/ha
Naturafonti Corporation	Hi-Shield Concentrate/ K ₂ O=4.4%, Na=6.5%, Gallic Acid=0.104%, Cu=1.1ppm, Mg=421ppm, Ca=466ppm, Fe=239ppm, Zn=3.2ppm	Banana	Apply the recommended Hi-Shield solution on the leaves once temperature is cool (Below 80°F/26.67°C/ Mix 1.5mL to 2mL Hi- Shield Concentration with 1L of water	38,818 kg/ha

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
National Institute of Molecular Biology and Technology (BIOTECH) - UPLB	Mykorich/ Vesicular Arbuscular Mycorrhizae (VAM)=200 spores per capsule		Inoculated during pricking at seedling stage/ 7.5g Osmocote 14-14-14 per plant combined with 1 capsule of Mykorich at 230 cfu/g inoculated per seedling	1.42 cm average stem diameter increment
	Mykocap/ Vesicular Arbuscular Mycorrhizae (VAM)=65 spores per capsule	Acacia	Inoculated during pricking at seedling stage/ 7.5g Osmocote 14-14-14 per plant combined with 1 capsule of Mykocap at 25 cfu/g inoculated per seedling	1.43 cm average stem diameter increment

4.b. Controlled Release

COMPANY	PRODUCT NAME	TRIAL	TIME AND DOSAGE OF	YIELD DATA
NAME	/GUARANTEED ANALYSIS	CROPS	APPLICATION	
Agway Chemicals Corporation	Great Planters Magnesium/ MgO=60%	Pechay	Chemical fertilizer applied basally at transplanting; GPMIF applied at pre- sowing stage followed by a min. of 20cm irrigation/ Application of chemical fertilizer at full recommended rate plus GPMIF 100kg/ha	2.17 t/ha

4.c. Soil Conditioner

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
	Diamond Grow Humi[K]-WSP/ K ₂ 0=12%, Humic acid=95%, Organic matter=50%, Total carbon=29%	Pechay	12 DAT (basal) reapplied up to 4 times (soil drench) every 14 days/ recommended rate of NPK fertilizer based on soil analysis combined with 10- 12kg/ha Humik WSP applied basally then 2 tbsp/16L water as soil drench	5.05t/ha
Corvill Agricom, Inc.	Primus Potassium Humate/ K ₂ O=12%, Humic acid=66.8%, Organic matter=72%	Pechay	1-2 DBT (basal), then reapply via drenching up to 4 times at 14 days interval/ recommended rate of NPK fertilizer based on soil analysis combined with 10- 12kg/ha Primus basally applied or broadcasted and	4.89t/ha

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
			2tbsp/16L water soil drenched	
	Diamond Grow Humik-Bio/ N=0.95%, K ₂ O=14%, CaO=1.52%, Fe=0.37%, Mg=0.15%, Humic acid=95%, Bacillus subtilis=6 x 10^7 cfu/g, Bacillus amyloliquefaciens=3.7 x 10^7 cfu/g, Bacillus pumilus=2.7 x 10^7 cfu/g, Bacillus licheniformis=7.2 x 10^6 cfu/g, Bacillus megaterium=7 x 10^6 cfu/g	Pechay	1st Application: 1-2 DBT through Basal/Broadcast; Succeeding Applications: After every 14 days through Soil Drenching/ Recommended Rate Inorganic Fertilizer and at 100% recommended rate plus 10-12kg/ha (1-2 and 2 tbsp./16L tank load of water	5.05 t/ha
Biosolutions International	Turbo Yield Booster/ K ₂ O=0.15%, Humic Acid=91%, Fulvic Acid=16%	Rice	14 DAT with succeeding applications done weekly/ 90-60-60kg/ha NPK fertilizer combined with 8mL/16L water Turbo Yield Booster foliar sprayed	5.04t/ha
Corporation	Biohumic Growth Enhancer/ K ₂ O=10%, Humic Acid=50%, Fulvic Acid=10%	Pechay	1st Application: 7 DAT Succeeding Applications: 14 DAT/ 90-30-30kg NPK/ha plus 2kg/ha of Biohumic	3.42 t/ha
3G's Advocates Inc.	3G's Foliar Soil and Plant Adjuvant/ N=0.15%, $P_2O_5=0.08\%$, $K_2O=0.42\%$	Corn	7 DAP repeat up to 5 times at 7 days interval/ recommended rate of NPK fertilizer based on soil analysis combined with 180ml 3G's FSPA/16L water at 12 sprayer tanks/ha	18.34t/ha
Captain's Farm Supply	Dragon Humus/ K ₂ O=11.9%, Humic Acid=69.1%, Organic Matter=84.6%	Rice	35, 45, and 65 DAT/ Basal application of 300g 14-14-14 and 40g MOP with top dress of 50g 45-0-0 combined with 3L/ha of Dragon Humus solution foliar sprayed	8.33t/ha
Aljay Agro- Industrial Solutions, Inc.	O'Valley Soil Conditioner/ N=2%, $P_2O_5=2\%$, $K_2O=5\%$, S=1.9%, Ca=2.4%, Fe=0.16%, Mg=0.28%, Cu=70.3ppm, Zn=144ppm, Mn=228ppm, Organic Matter=11%, Humic Acid=3%	Tomato	Basal application before transplanting/ O'Valley Soil Amendment at 0.5 and 1.5 and application of chemical fertilizer at full recommended rate based on Soil Analysis	17.25 t/ha

4.d. Plant Growth Regulator

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
Vann Hawk Agro Chemicals, Inc.	Hormex Rooting Powder/ Indole-3-Butyric Acid=0.3%	Orchid	Basal and 60 DAT before transplanting/ Recommended rate of inorganic fertilizer treatment was applied in two split applications as basal and 60 days after transplanting 10-30-20 water soluble inorganic fertilizer for orchids was evenly dissolve at 1 tbsp per gallon of water and spray unto the plants	4.56 t/ha
		Kangkong	0, 30, and 51 DAP/ Recommended rate of NPK fertilizer based on soil analysis applied basally and side dressed combined with 1L Providence/12L water sprayed foliar, drench at 0 DAP	33.44t/ha
Santine Philippines, Inc.	Providence/ N=9%, Total amino acids=50%	Okra	15, 30, and 45 DAP/ Recommended rate of NPK fertilizer based on soil analysis applied basally and side dressed combined with 1L Providence/12L water sprayed via foliar	11.26t/ha
		Rice	transplanting, tillering, panicle initiation, and milking stage/ Recommended rate of NPK fertilizer based on soil analysis applied basally and side dressed combined with 1L Providence/12L water sprayed via foliar	4.8t/ha
Stoller Philippines, Inc.	X-Pand/ GA ₃ =12%	Lettuce	Spray at 14 and 21 DAT/ Inorganic Fertilizer at full recommended rate plus X- Pand at 0.02 L/ha per application	6837.04 kg/ha
Heavenly Mist Organics Incorporated	M0X Plant Growth Enhancer/ N=0.29%, P ₂ O ₅ =0.05%, B=120.3ppm, Ca=0.03%, Mg=0.49%, Na=73ppm, S=0.72%, GA ₃ =1.5%, IBA=0.63%, Organic matter=5.88%	Rice	seed soaking, seedling, pre- booting, and grain filling stage/ Foliar spray 32mL/16L water of M0X	4.67 t/ha

COMPANY	PRODUCT NAME	TRIAL	TIME AND DOSAGE OF	YIELD DATA
NAME	/GUARANTEED ANALYSIS	CROPS	APPLICATION	
AMRI Trading	Check-Up Booster/ Indole-3-Butyric Acid=0.08%	Rice	Check-up Booster sprayed at 20 and 45 DAT; Inorganic Fertilizer sprayed at 10, 20, and 30DAT/ Check-up Booster sprayed at the rate of 3mL / 16L water in combination of the recommended rate of inorganic fertilizer at 80-60- 70 kg NPK/ha	7.54 t/ha

4.e. Inorganic Fertilizer

COMPANY	PRODUCT NAME	TRIAL	TIME AND DOSAGE OF	YIELD DATA
	Tawawa Forte/ N=4%, P ₂ O ₅ =4%, K ₂ O=4%	Pechay	40mL mix with 16L water of knapsack sprayer (8 tank loads per ha interval at 7 days a total of 2 li per ha/ 90-20-20 kgs NPK plus 2L/ha 4 %N-4% P-4%K Tawawa Forte Foliar Fertilizer	10.42 t/ha
Hari Works Corporation		Pineapple	5 li /ha of Tawawa Maximo (6-3-3) Foliar fertilizer Solutions will be sprayed in treatment 4,5,6 during early morning and late in the afternoon at twice a month interval until 1 moth before harvest.	62.04 t/ha of pineapple fruit
	Tawawa Maximo/ N=6%, P ₂ O ₅ =3%, K ₂ O=3%	Corn	2 li/ha of Tawawa maximo (6-3-3) Foliar Fertilizer. Spray solution at the rate of 80 ml/lo knapsack sprayer shall be sprayed 15 days before tasseling and shall be repeated 15 days after. / 92-69-67-22S-11 Mg kgs NPK/ha +5 li/ha Tawawa Maximo Fertilizer (full RNF). For corn, 120-90-60 NPK (full RR) +2 li/ha Tawawa Maximo (full recommended application)	5.20 t/ha of dry weight of grains
Mischa Agro Industrial Corporation	Malago Solid Foliar/ N=5.45%, P ₂ O ₅ =5.28%, K ₂ O=3.37%	Pechay	Spray at flowering stage until 1 week before the last harvest at (7 days) interval/ 2.86 (14-14-14) bags/ha + 10tbsp of Malago Foliar Fertilizer/16L water	24,500 kg

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
JOCANIMA	/ Metalosate Boron Liquid/ B=5%	Banana	Apply during periods of nutritional stress repeated 2 or more time 4 - week intervals through the cropping season to increase bunch weight and box - stem ratio/ Metalosate Boron at 0.5L/ha/cycle is recommended for registration with fertilizer and Pesticide Authority	0.5 t/ha
Corporation	Metalosate Magnesium Liquid/ Mg=2.1%		Apply during periods of nutritional stress repeated 2 or more time 4 - week intervals through the cropping season to increase bunch weight and box - stem ratio/ Metalosate Calcium at 0.5L/ha/cycle is recommended for registration with fertilizer and Pesticide Authority	24.60 t / ha
Agway Chemicals Corporation	Omnimol/ Mo=25%, P ₂ O ₅ =11%	Corn	Several applications may be required 7-10 days apart/ Recommendation apply as required but do not exceed 1L/ha per application	11.41 t/ha
Agrotiger Phils., Corporation	Hyfer Plus Ultra/ N=9%, P ₂ O ₅ =6%, K ₂ O=4%, Zn=46ppm, B=0.017%	Lettuce	Basal application as foliar spray as 7 and 15 DAP/ Dilute 40 to 60 mL in every 16 liters of water	7.46 t/ha
Green World Agri-Solution, Inc.	Excel Crop Growth Booster/ N=5%, K ₂ O=2.5%, Ca=26%, Mg=0.1%, S=3%, Mn=28ppm, B=47ppm, Fe=130ppm, Na=1700ppm	Pechay	7 days after transplant 10 - 14 days interval/ Recommendation was 3 - 5 tbs per 16 liters as suggested in the dosage of application	1.32 t/ha
Agro Alternatives, Inc.	Silika Liquid/ Si=6%	Rice	T6- 100% RRIF+ 100 % SILIKA Chemical fertilizer (g/ 1m2) 33g urea, 50 solophos, 15 g muriate of potato plus silika at 10 ml of water applied at root dipping before transplanting, active tillering panicle initiation, booting and milking stage. / Recommendation was 5 ml of silika per liter of water (dipping solution). Spray 1- 2 liters of silika per hectare of application.	6.93 t/ha
Juro Agri Mart	Jurofert/	Pechay	4-5 tbsp/ 16 Liters of Water Spray at 7 - 10 days interval.	93.5 t/ha

COMPANY	PRODUCT NAME	TRIAL	TIME AND DOSAGE OF	VIELD DATA
NAME	/GUARANTEED ANALYSIS	CROPS	APPLICATION	
	N=4.11%, $P_2O_5=1.32\%$,		Best Result when apply	
	K ₂ 0=0.78%		early morning and late	
			afternoon/	
			Recommended rate of	
			from soil analysis (130	
			g/nlot 14-14-14+20 g/nlot	
			46-0-0 recommended rate	
			of commercial foliar	
			fertilizer Caligro (3 tbsp/gal	
			H2O	
			Basal Application and 14	
_			DAP	
Vann Hawk	Megatonic 1.5-1-1/		14 days after planting and 7	
Agro	$N=1.5\%$, $P_2O_5=1\%$, $K_2O=1\%$	Pechay	days interval until one week	12.92 t/ha
Chemicals, Inc.			before harvest/	
			application was 60 ml/16 I	
			water	
			Basal Application and 14	
			DAP	
	NZX5 (NitroZincX5) A and B/		14 days after planting and 7	
Cron Science	N=10%, P ₂ O ₅ =6%, K ₂ O=1.7%,		days interval until one week	
Research	B=0.2%, Cu=0.3%, Fe=0.2%, Mg=1%, Mn=0.1%, Zn=8.4%	Pechay	before harvest/	35.70t/ha
Industries			Application of 2.0 RR	
			NZX5A and B Foliar	
			Fertilizer at the rate of 100m A + 100m B / 16 J	
			1001111 A + 1001111 B/ 10 L water/ba	
			15 30 and 45 DAT Booting	
	Good Harvest Foliar/		flowering/	
Deligrand Agri	N=1.7%, P ₂ O ₅ =0.5%, K ₂ O=4.5%,	5%, Rice	Recommended rate of Good	8.61 t/ha
Irading	Ca=30%		harvest fertilizer RRIF 90-	
			30-30 + RRG 5 tbsp/16 L	
			water	
			1/2 of N and all P205 and	
			K20 was applied in band	
			along furrows before	
			annlied at 13 days after	
	Tierramino 30/		transplanting (DAT)/	
	N=2.45%, Mn=0.3%,		Recommendation rate of	
	Zn=0.28ppm, M0=545ppm,	Pechay	inorganic fertilizer gave an	11.95t/na
Uniloy For	Ammo aciu-30%		optimum marketable yield	
East			of pechay of more than 11	
Resources. Inc.			t/ha. tierra amino is	
Kesburces, Inc.			recommended as one of the	
			soll conditioners applied to	
			commercial production	
			From planting up to 1	
	TierrAmino 10% Copper Amino		month before harvest at	
	Acid Chelate/	Pineapple	semimonthly interval/	27.39t/ha
	Cu=10%, Amino acid=45%	- *	92-69-67-22S-11Mg kg/ha	mealum fruits
			NPK + 4kg/ha Tierramino	
			10% CAAC	

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
Nature-Tech Innovation Group, Inc.	Natural Green Inorganic Fertilizer/ CaO=35.52%, MgO=2.74%, SiO ₂ =2.36%, Fe=1176ppm, Mn=144ppm, Zn=16ppm	Pechay	Vegetative stage/ Natural Green is used for leaf spraying in concentrations of 0.2 % to 0.5 % the recommended concentrations depends on various plant types and on plant development, depending on the amount of water spray the recommended concentrations correspond to the following required quantities in liters / hectare	26.97t/ha
Sinochem Crop Protection (Phils.), Inc.	Vigoro/ K ₂ 0=7.5%, B=0.4%, Cu=0.18%, Fe=1.2%, Mn=1%, Zn=1.2%, Mo=0.01%, Alginic acid=2.5%, Organic matter=42.3%	Rice	10 DAP with 7 days interval until 7 days before harvest/ Recommended rate at 625- 1250g/ha, applied in 500L water per ha as foliar spray combination with organic fertilizer	9.34 t/ha
	Magnus/ Zn=4.5%, Fe=4%, Mn=3%, Cu=1%, B=1%	Pechay	10 DAP and 7 days interval until one week before harvest/ Inorganic Fertilizer at full recommended rate plus Treat Fertilizer at the rate of 250 g/500L water	36.16 t/ha
Envireau Pacific, Inc.	Folistim Humi Zn/ Zn=10.7%, S=13.3%	Tomato	3-5 DAT at 2 weeks interval/ 400kg/ha 14-14-14 and 267kg/ha urea applied basally combined with 1.5L Folistim Humi Zn/ha foliar sprayed	31.37t/ha
Donato C. Cruz Trading Corporation	Cambiar N/ N=24%	Rice	15 and 30 or 45 DAT/ 45-30-30kg/ha NPK fertilizer applied basally and side dressed combined with 1.5L/ha Cambiar N foliar sprayed	6.02t/ha
ENLASA Phils., Inc.	Protecsol SL/ SiO ₂ =2.6%	Pineapple	Upon planting until 1 month before harvest at semimonthly interval/ 92-69-67-22S-11Mg kg NPK applied basally combined with 5L Protecsol SL/ha foliar sprayed	27.47t/ha
Xanadu Agri Products, Inc.	Xanadu Maxpower F1/ N=27%	Rice	Spray every 7-14 days/ Recommended Rate Inorganic Fertilizer at full recommended rate plus Maxpower F1 at 100% rate	7.08 t/ha

COMPANY	PRODUCT NAME	TRIAL	TIME AND DOSAGE OF	VIELD DATA
NAME	/GUARANTEED ANALYSIS	CROPS	APPLICATION	
			(Mix 100-200mL into 20L of	
T 11			water)	
Jardine	Omex Kingfol Zinc/	Rice	10 DAT/ 11 Omey Kingfol Zinc /ha	8 15t/ba
Inc	Zn=40.5%	Rice	foliar sprayed at 100ml/16L	0.150/11a
inc.			water dosage	
			Every week DAT/	
Tag Life	Tag Life Foliar/		Inorganic Fertilizer at full	
Corporation	M = 4.91%, B = 0.4%, Ca = 0.86%, Cu = 0.51%, Mg = 0.37%	Lettuce	recommended rate plus 45g	9.38 t/ha
dorporation	Mn=7.05%, Zn=2.95%		of Tag life inorganic	
			fertilizer per 16L water	
			Basal Application, every	
Agrotiger	Hyfer Urea May/		ninth month/	
Phils.,	N=44%. Humic Acid=13%	Banana	Inorganic Fertilizer at full	25.08 t/ha
Corporation			recommended rate plus 20	
			bags Hyfer Urea Max	
			Fertilizer /ha/year	
			Apply along with seeds at	
Vast Agro	WeeSoo 12-43-0-0 847n/		maximum effect on vield /	
Solutions. Inc.	$N=12\%$, $P_2O_r=43\%$, $Zn=0.7\%$.	Corn	80kg/ha of WeeSoo plus	7.34 t/ha
	MgO=2%, SO ₃ =11%	00111	recommended rate of NPK	
			0-0-60 based on soil	
			analysis	
			20 DAS/	
Zetryl.Chem	Plantafol 10-54-10/ N=10%, P ₂ O ₅ =54%, K ₂ O=10%, Fe=0.1%, Zn=0.05%	Pechay	Lombination of Plantafol	
Phils., Inc.			practice (RR) can increase	2 to 3 t/ha
			yield up to 20%	
			Upon planting repeated at	
Agrigrowth	Zinlmich (Dechary	7-10 intervals/	10.1+/ba
Corporation	$Z_{n=15\%}$ S=10%	Pechay	combined with 1L Zinkrich	10.11/11a
corporation	211-13 /0, 3-10 /0		Liquid Foliar/ha foliar	
			sprayed	
			Upon transplanting for	
			foliar and 14 DAT for basal	
	Liqui Plex ZnMnB/	Lottuco	spray/	7 11+/ba
	N=0.45%, B=0.5%, Mn=3%,	Lettuce	at 450g/ha and urea applied	7.11t/11a
	Zn=3%		at 150g/ha combined with	
A11. 1			1L Liquid Plex/ha sprayed	
Riotechnology			via foliar and basally	
Corporation			Grain Set at 16, 45, 59 and	
			73 DAT and Soil Set at 3 and	
	Grain Set/ Mn=0.8%	Rice	Application of chemical	
			fertilizer at full	6.57 t/ha
			recommended rate plus	
			Grain Set at 75mL/16L	
			water plus Soil Set at 120	
			mL/16L water	

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
	Soil Set/ Cu=2%, Fe=1.6%, Mn=0.8%, Zn=3.2%	Rice	Soil Set at 3 and 7 DAT and Grain Set at 16, 45, 59 and 73 DAT/ Application of chemical fertilizer at full recommended rate plus Soil Set at 120 mL/16L water plus Grain Set at 75mL/16L water	6.57 t/ha
Bulwarc Technologies, Inc.	Toggle Plus/ N=0.8%, P ₂ O ₅ =0.3%, K ₂ O=1.3%, Zn=2%	Rice	1. 3 DAT; 2. 35 DAT; 3. 55 DAT/ Application of chemical fertilizer at full recommended rate plus Toggle Plus at 1L/ha	5.39 t/ha
Eagle Stance Enterprises	Hi-Grow +/ N=2.2%, P ₂ O ₅ =0.5%, K ₂ O=0.3%, Humic Acid=3.6%	Pechay	7,14, 19, and 24 DAP/ 120-50-60kg NPK fertilizer combined with 60mL/16L water of Hi-Grow +	34.24 t/ha
Harbest Agribusiness Corporation	Naturcomplet-G/ N=1.12%, K ₂ O=3.87%, Humic acid=30%, Fulvic acid=5%	Corn	25 DAP Basal/ 200-300 kg/ha	36 t/ha
iAgri Chemical Corporation	NEB-88/ Organic matter=35-40%	Corn	Application at 7, 14, and 21 DAS/ NEB-88 Seed Treatment applied at 5mL/kg seed plus 625 mL of NEB-88 blended on RR Urea foliar spray at 8mL/16L	8.61 t/ha
JJAA Agricultural Products Trading	FullOn Liquid Fertilizer/ N=0.45%, P ₂ O ₅ =0.1%, K ₂ O=0.7%, Humic Acid=20%	Pechay	30 DAT/ half the recommended rate of inorganic NPK fertilizer based on soil analysis and full recommended rate of FullOn sprayed at 4mL/gal water	70 t/ha
Now Win Resources and Trading	Sun Green Foliar/ SiO ₃ =10%	Corn	15 and 30 Days after Germination (DAG) and at formation of corn ears/ 2 kg/ha Urea during planting and 2.1 mL Sun Green mixed in 16L water per 21 sqm. plot	11.45 t/ha
Philippine Aqua- Hydroponic Prime Ventures Corporation	Masterblend 5-11-26 Hydroponic Formula/ N=5%, P ₂ O ₅ =11%, K ₂ O=26%, S=4%, Cu=0.015%, Fe=0.3%, Mg=3.11%, Mn=0.05%, Zn=0.015%, B=0.05%, Mo=0.01%	Lettuce	In contact with crops for entire cycle due to it being a growing medium/ 10g Masterblend A + 10g Masterblend B mixed in 10L of water	2.94 t/ha
Philippine Hydroponics and Technology Corporation	Yamasaki Hydroponics Recipe/ A: N=14.8%%, K ₂ O=20.5%; B: N=8.8%, P ₂ O ₅ =9.2%, K ₂ O=28.2%	Lettuce	In contact with crops for entire cycle due to it being a growing medium/	57.71g average plant weight

COMPANY NAME	PRODUCT NAME /GUARANTEED ANALYSIS	TRIAL CROPS	TIME AND DOSAGE OF APPLICATION	YIELD DATA
			37.5mL SNAP A + 37.5mL SNAP B + 75mL Yamazaki B mixed in 10L of water	
	entures BAM-FX Mineral/ ding Cu=2.1%, Zn=6.9% ration	Sweet Potato	1 MAP until 3rd month at biweekly interval/ 60-60-60kg/ha NPK combined with BAM-FX sprayed at 4oz/gal water	9.07 t/ha
Saraventures Trading Corporation		Tomato	1 MAP until 3rd month at biweekly interval/ 120-90-90kg/ha NPK combined with BAM-FX sprayed at 4oz/gal water	12.2 t/ha
		Cabbage	1 WAT up to 1 week before harvest at weekly interval/ 150-90-90kg/ha NPK combined with BAM-FX sprayed at 8oz/gal water	2.75 t/ha
UPL Philippines, Inc.	Pilatus/ Zn=4.92%	Rice	15, 30, and 45 DAT/ full recommended rate of NPK fertilizer and full recommended rate of Pilatus at 2L/ha	7.83t/ha

The project is designed to generate data on but not limited to:

- a. Supply, distribution, demand and prices of registered fertilizers;
- b. Reports on registered fertilizer and other agricultural products, its licensed handlers, product name, its target crops, plant growth stage and direction for use upon application (Table 3);
- c. Reports on registered fertilizer for hydroponics;
- d. Availability of registered fertilizer products per region;
- e. Reports on the list of licensed fertilizer handlers;
- f. Reports on unregistered products circulating in the market

Fertilizer Watch System Sub-Committee is tasked to coordinate with Data Management Sub-Committee to facilitate proper documentation, maintenance, analysis of the collected data.

In addition, FWS Sub-Committee is tasked to coordinate with the Extension Support, Education and Training Sub-Committee to facilitate the preparation of reports and other promotional activities concerning the Program.

2. Data Management System Sub-committee

The FPA-BFS TWG assigned the Data Management Sub-Committee to collect and collaborate effectively and efficiently all the activities related to the implementation of the BFS Program.

In line with the Fertilizer Watch System Project, Data Management Sub-Committee is tasked to establish and continuously develop a database on but not limited to:

- a. Supply, distribution, demand and prices of registered fertilizer products;
- b. Reports on registered fertilizer and other agricultural products, its licensed handlers, product name, its target crops, plant growth stage and direction for use upon application (Table 3);
- c. Fertilizers applied through hydroponics;
- d. Reports on the list licensed fertilizer handlers;
- e. Reports on unregistered products circulating in the market;

The sub-committee is required to use an effective tool for proper documentation and maintenance of files.

3. Extension Support, Education and Training Services Sub-committee

Joint collaborative plans with BFS TWC are well coordinated to ensure proper implementation of the projects on the BFS Program. The FPA-BFS TWG created the Extension Support, Education and Training Sub-Committee to facilitate the overall external and internal activities of FPA concerning BFS Program.

In line with FPA thrust to support the "Plant, Plant, Plant Program" of the Department of Agriculture through BFS Program, the Extension Support, Education and Training Sub-Committee is specifically tasked to:

- 1. Facilitate the collaboration with ATI with regard to the conduct of trainings, and extension activities about proper fertilizer handling, the 4Rs (Right Nutrient, Right Quantity, Right Method, Right Time), and the regulatory processes concerning fertilizer;
 - 1.1 FPA designated personnel with expertise to aforementioned topics to act as a resource speaker during trainings; and
 - 1.2 FPA assigned personnel to participate in the National Training of Trainers on Site-Specific Nutrient Management.
- 2. Facilitate the collaborative research and studies with BAR for the development of new fertilizer formulations and other soil amendment technologies (organic fertilizers and soil enhancers/conditioners);
- 3. Facilitate the collaboration with BAFS in the formulation of standards for the registration of fortified organic and inorganic fertilizers;
- 4. Facilitate the collaboration with BAFE with regard to the application of fertilizer using new agricultural machineries and equipment;
- 5. Facilitate consultative meeting on the crafting of new projects concerning BFS Program;
- 6. Prepare a progress reports of all the FPA projects concerning BFS Program;
- 7. Coordinate with the Data Management Sub-Committee for the maintained and documented information on the various events and activities of the BFS program to be used for promotions;

- 8. Update the public on the FPA projects and activities concerning BFS Program through articles, reports publications, audio-video materials, utilizing different promotional platforms; and
- 9. Conduct public information campaigns regarding the circulation of unregistered fertilizer products in the market through public advisory on the official FPA Websites and social media accounts.

FPA-BFS Program Recommendation

With increasing fertilizer prices globally, land degradation, and declining soil fertility, various programs Programs/Projects/Activities (PPAs) related to the implementation of Balanced Fertilization Strategy (BFS) are recommended by FPA-BFS TWG as comprehensive actions to mitigate the effects of the soaring prices of fertilizers and other environmental issues concerning to fertilizer.

In fulfillment of the PPAs function to the Program, Table 5 shows support services recommendation by the FPA-BFS TWG.

Training Services				
P/P/A	Description	Target Stakeholders		
Accredited Safety Dispenser Training for Proper Handling of Fertilizer	A two (2) day consolidated fertilizer and pesticide training and accreditation program in concerning proper handling and effective use of fertilizer to implement a reasonable and socialized approach to fertilizer and pesticide safety advisory as a form of regulatory measure in the selling and disposition of fertilizer and pesticide. ASD Training is one of the requirements in the issuance of a dealer license. An individual who attended and has passed the corresponding examinations shall be issued an accreditation card by FPA.	This training covers the owner, or personnel of licensed dealer stores and persons involved in networking or multi-level marketing who are also known as Individual Business Operators (IBO) selling fertilizer, pesticide, and other agricultural chemicals.		
	Information regarding the schedules and venues of ASD Training are all posted on FPA's Official Website.			
Training for the Accreditation of Fertilizer Researchers	FPA in partnership with different training associations/organizations conduct this two (2) day training to update and upgrade the technical knowledge of fertilizer researchers. Accredited fertilizer researchers are the ones who conduct experiments/bioefficacy trials to generate data to support the registration of new fertilizer grades also termed as Non-Traditional Products. The research discipline includes Plant Nutrition.	All fertilizer researchers who conduct bioefficacy trials.		
Training on proper Fertilizer Handling and Nutrient Stewardship through 4Rs	This proposed training is to be coordinated and collaborated with Agricultural Training Institute. This training targets the promotion of fertilizer Best Management Practices (BMP) to improve nutrient use efficiency and environmental	This covers the farmers and FPA fertilizer licensed handlers and other business ventures.		

Table 5. Programs/projects/activities (PPAs) related to the implementation of the BFS

(Right Nutrient, Right Quantity, Right Method, Right Time)	sustainability while supporting the farmer's profitability. This leads to the concept of the 4R Nutrient Stewardship Strategy (Right Nutrient, Right Quantity, Right Method, Right Time).	
	Farm or Business Advisory	Г <u> </u>
P/P/A	Description	Target Stakeholders
Fertilizer Watch System	Reports on the list of licensed fertilizer handlers will be published as a public reference on	This covers mainly the farm owners; and for the public in general
	purchasing of registered fertilizers.	F G
	Reports on the fertilizer supply, distribution, demand and prices of registered fertilizer products.	
	The farm owners can use these reports to directly contact or locate these licensed handlers and be ensured of buying only registered, quality and safe products.	
Hydroponic Production System	Reports on the list of registered fertilizer applicable as hydroponic solutions for the reference of the farm owner.	This covers mainly the farm owners; and for the public in general.
	Right mixing, application and the right nutrient solution per crops to be included in the guidelines or in the proposed new product label template (Proposal)	
	Technology Demonstration Servic	ces
P/P/A	Description	Target Stakeholders
Field Testing of New Developed Fertilizer Grade	Proposal on the formulation of new fertilizer grade and other soil amendment technologies to be collaborated and coordinated with BAR. Field Testing will be the major contribution of FPA	This covers mainly the fertilizer end user and licensed fertilizer handlers; and for the public in general.
Field Testing of	In collaboration with BAFE about the application	This covers mainly the fertilizer end
New Developed Machineries and	of fertilizer using new agricultural machineries and equipment.	user and licensed fertilizer handlers; and for the public in general.
fertilizer	This includes precision fertilizing using Drones or	
application	UAV. Guidelines on this activity will be drafted.	
]	Information and Communication Support Services	s through Tri-Media
P/P/A	Description	Target Stakeholders
Fertilizer Watch System	Update the public on the FPA Projects and Activities with regard to BFS Program through publishing articles, reports, videos and other promotional platforms.	This covers mainly the fertilizer end user and licensed fertilizer handlers; and for the public in general.
	keports on the list of licensed fertilizer handlers will be published for the reference of the end users of where to buy registered fertilizers with details on target crops, dosage and directions for	
	use.	

Fertilizer Watch System	Conduct of public information campaigns regarding the circulation of unregistered fertilizer products in the market.	This covers mainly the fertilizer end user and licensed fertilizer handlers; and for the public in general.
	For the awareness and information of the public regarding unregistered fertilizer circulating in the market will be through a public advisory on the official FPA Websites and social media accounts.	
FPA Webinar Series	Series of webinars are done via Zoom Platform. The activity aims to accommodate and clarify public inquiries and concerns about the mandate and functions of FPA, and other FPA issued guidelines in the implementations of its programs. For Fertilizer concerns, the webinar series include the discussion on the process and requirements	This covers mainly the Farmer's Organizations and Associations, and other business ventures; and for the public in general.
	for the Issuance of License to Operate for Manufacture, Processor, Formulator, Bulk Blender, Bulk Handler, Importer, Importer End- User, Institutional User, Indentor, Exporter, Repacker, Area Distributor, and National Distributor.	
	are product registration, issuance of experimental	
	use permit and other permits.	
P/P/A	Description	Target Stakeholders
Formulation of standards for the registration of fortified organic and inorganic fertilizers	This activity aims to formulate standards for the registration of organic and inorganic fertilizers in coordination with BAFS.	This covers mainly the fertilizer end user and licensed fertilizer handlers; and for the public in general.
Development of Information Materials	Proposal for the development of the existing FPA Website/Info materials on Fertilizer Regulatory Policies and Implementing Guidelines, 4Rs Nutrient Stewardship, etc. in coordination with ATI.	For the public in general.

Meanwhile, the FPA prioritizing the fertilizer price increase mitigation does not overlook the importance of implementing related activities without compromising soil fertility, structure, crop yield and income of the farmers. As such, the Agency strongly recommends the use of registered and certified fertilizer products found on Table 3.

FPA-BFS Impact Assessment

The FPA-BFS TWG and its Sub-Committees are required to meet quarterly before the scheduled date of TWC Impact Assessment on BFS Program or as often as may be deemed necessary to review the progress reports including significant findings and other developments.

The FPA-BFS TWG is tasked to meet quarterly with the BFS TWC for Impact Assessment of BFS Program on the crop production, fertilizer use and availability, and market price.

References

- Abbott, C. 2021. More farmers worry about large increases in input costs. Retrieved from https://www.agriculture.com/news/business/more-farmers-worry-about-large-increases-in-input-costs
- Baffes, J. and Koh, W. 2021. Fertilizer prices expected to stay high over the remainder of 2021. Retrieved from https://blogs.worldbank.org/opendata/fertilizer-prices-expected-stay-high -over-remainder-2021
- Briones. R. 1980. Discussion Paper Series No. 2020-42. Philippine Institute for Development Studies.
- Briones, R. 2020. The Unfinished Agenda of Trade Liberalization in Philippine Agriculture: Assessing the Impact of Reducing Tariff and Nontariff Barriers. Retrieved from https://pidswebs.pids.gov.ph.
- Fertilizer and Pesticide Authority (2019). *Fertilizer Regulatory Policies and Implementing Guidelines.*
- McGinnis, M. 2021. Factors expected to drive the 2022 corn market. Retrieved from https://www.agriculture.com/markets/factors-expected-to-drive-the-2022-corn-market
- Ostendorf, M. 2021. What is going on with fertilizer prices? Retrieved from https://www.agriculture.com/news/crops/skyrocketing-fertilizer-market-has-farmers-analysts-and-companies-weighing-in
- US Metric Association (USMA), 2022. Commonly used metric system units, symbols, and prefixes (The Basics of the Metric System). Retrieved from usma.org