



Report of the Sectoral Oversight Committee on Food Security and Agriculture
on
Policy Recommendations to Address the Issues Pertaining to Fertilizer
Application Program for Agricultural crops in Sri Lanka

Presented to the Parliament by
The Hon. D. Weerasinghe
Chair of the Committee
On Tuesday 22nd August 2023



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Agriculture**

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Application Program for Agricultural crops in Sri Lanka**

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Members of the Sectoral Oversight Committee on Food Security and Agriculture

Hon. D. Weerasinghe (Chairman)
Hon. Chamal Rajapaksa
Hon. C.B. Rathnayake
Hon. S.M. Chandrasena
Hon. Vasudeva Nanayakkara
Hon. R.M. Ranjith Madduma Bandara
Hon. Dilip Wedaarachchi
Hon. Kapila Athukorala
Hon. Govindan Karunakaram
Hon. Milan Jayathilake
Hon. Kins Nelson
Hon. Sudath Manjula

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1. Introduction

Sectoral Oversight Committee on Food Security and Agriculture had summoned Ministry of Agriculture, Department of Agriculture (DOA), Department of Agrarian Development, National Fertilizer Secretariat, Ceylon Fertilizer Company Ltd. and Colombo Commercial Fertilizer Company on 04.04.2023 to discuss issues pertaining to Fertilizer Application program for Agricultural crops in Sri Lanka. The Committee had summoned number of meetings to discuss the matters with the participation of officials representing public and private institutions including experts of this subject and Fertilizer Associations. Based on those discussions and the evidence received from relevant institutions in the form of reports and statistics this report was prepared by the Sectoral Oversight Committee to provide observations, proposals, opinions, and recommendations of the Committee to the Parliament.

The content of the report opens on section 4 which highlights the background of the country's need for a sustainable mechanism with regard to fertilizer application for enhancing crop production. Section 5 covers the information gathered from discussions and the related resource material. Section 6 concludes the report by presenting a set of recommendations to address the objective.

2. Government Institutions summoned to the Committee

Ministry of Agriculture
Department of Agriculture (DOA)
Department of Agrarian Development
National Fertilizer Secretariat
Sri Lanka Standards Institute
Ceylon Fertilizer Company Ltd.
Colombo Commercial Fertilizer Company

3. Experts and other Institutions invited to the Committee

National Institute of Fundamental Studies (NIFS), Headquarters in Kandy
Sri Lanka Institute of Nanotechnology (SLINTEC)
Green Agriculture Fertilizer Manufacturers Association

4. Background

Application of Fertilizer as an Agriculture input

Application of chemical fertilizers in Sri Lankan agriculture was started in 1960's after the green revolution. The fertilizer application with improved seeds and new irrigation schemes increased crop yields tremendously to match the demand of the increased population in the past. However, after about six decades of the chemical fertilizer practice with adverse effects on the crop health, human health and the environment, it has now been reported that the agriculture should be diverted to a practice in which eco-friendly inputs should be used as much as possible. As such, increasing the use of eco-friendly inputs to meet the country's demand for crop production is one of the goals that has been set in the National Agricultural policy in Sri Lanka, compiled by the Ministry of Agriculture. The scope of the policy is further explained with a set of thematic areas, which includes Eco-friendly Operations, accompanied by the policy statement – “Support sustainability in agriculture development through conservation and utilization of natural resources while safeguarding ecosystems and ecosystem services”.

In addition to the above, Sri Lanka and the Member countries, with the support of the UN Environment Programme (UNEP), came to a collective agreement – “Colombo Declaration” in 2019, with an aspiration of reducing the nitrogen waste by half by 2030.

With respect to the above targets, a sustainable mechanism needs to be introduced for producing fertilizers, plant stimulants, soil conditioners, and implementing plant protection technologies to meet the national needs of the agricultural sector.

Importance of maintaining soil fertility for sustainable Agriculture

Research has shown that about 60-70% of nitrogen (urea) fertilizer is lost in paddy cultivation in Sri Lanka. Potassium (MOP) fertilizer is also lost. The main reason for this is the depletion of soil organic matter in conventional, chemical fertilizer-based agriculture. Therefore, maintaining soil fertility is important to maintain soil organic matter along with the fertilizer nutrient retention, efficient nutrient recycling, and also disease and pest control, all of which contribute to sustainability of agriculture.

Present Policy of the Department of Agriculture on Fertilizer Application

The Integrated Plant Nutrition System (IPNS) has been accepted as the most efficient methodology to obtain the optimal yield by giving the nutrients required by the plant in the right quantities at the right time. In this method, scientists have proven that high results can be obtained by increasing the fertility of the soil when chemical fertilizers are applied together with organic fertilizers and biofertilizers while reducing the soil depletion and environmental pollution.

5. Observations

1. The DOA has recommended 70% of chemical fertilizer and 30% of organic fertilizer and biofertilizer to achieve the maximum return.

The DOA has formulated chemical fertilizer recommendations for all crop types, and also 10 Tons per Hectare of Organic fertilizer application along with the recommended chemical fertilizer is prescribed.

The Committee appointed by the DOA for the Revision of Fertilizer Recommendation for Rice in 2013 has recommended that application of organic fertilizer should be made compulsory to overcome many soil fertility constraints.

2. To overcome the practical difficulties to apply large quantities of organic fertilizer as recommended above, technologically improved new types of Organic and Biofertilizers have been developed and commercially introduced by the public and private sectors.

a) Granular/Pellet/Liquid Organic and Biofertilizer types

The Department of Agriculture has tested the efficacy of 14 types of locally manufactured new fertilizers and imported products in liquid and solid forms provided by the National Fertilizer Secretariat. The field experiments have been carried out in three different locations of research centres under the Department of Agriculture (2020/21 Maha Season and 2021 Yala Season) and tested the yield performance for 70% chemical fertilizer + 30% organic fertilizer. If the yield in 70% chemical + 30% organic fertilizer is statistically similar or higher to 100% chemical fertilizer, the product has been recommended. Accordingly, 10 products have been temporarily recommended. With the 70% chemical fertilizer, those products have been applied at the rates of 2.5 to 40 litres per hectare of the liquid fertilizers,

and 0.38 to 2 Tons per hectare of the solid fertilizers, which is well below the 10 Tons per hectare of organic fertilizer with the 100% of chemical fertilizer, recommended previously. All the new fertilizer products have been tested at once in the same location (Paranthan) only during Yala 2021. According to that season, the new fertilizer products have increased paddy yield by 13-25% over the 100% of chemical fertilizer alone. This clearly shows the potential of the 70% chemical + 30% organic fertilizer practice as the new fertilizer policy for the country. If implemented successfully, this new fertilizer policy will save several billions of rupees on the chemical fertilizer imports, and also it will save the crop health, human health and the environment.

Details of extensive farmers' field-testing of the new fertilizer products: These details of only two new fertilizer products have been received to the Committee.

b) Biofilm Biofertilizer (BFBF)

Biofilm biofertilizer (BFBF) is a world's first, novel microbial biofertilizer product developed by the National Institute of Fundamental Studies (NIFS) in Kandy, which is under the purview of the Ministry of Education (Research and Innovation Division). The BFBF was patented in 2013 in Sri Lanka and titled "Biofilm biofertilizer for the improvement of soil fertility and crop production". After successful, extensive, research station and farmers' field research, the Cabinet approved the BFBF, with the title "Promotion of Biofilm Biofertilizer in paddy cultivation Island wide". The BFBF has been tested for paddy in 105 trials in 13 districts in collaboration with the DOA. Application of the BFBF (2.5 litres per hectare) in paddy cultivation has reduced the farmers' chemical fertilizer (urea, TSP & MOP) use by up to 50%, and has increased the paddy grain yield by up to 20-30% on average. This has been demonstrated in 285,000 acres of paddy cultivation in the country with accompanying an economic benefit of about Rs. 10 billion to the country via the chemical fertilizers cut down and the yield increase for farmers. The DOA gave the recommendation for the BFBF for reducing urea, TSP and MOP use by 30% in paddy cultivation in 2022. Now, the NIFS has proven from field research that the BFBF can reduce urea, TSP and MOP use by 34% in paddy cultivation.

c) Nano Urea (HA Urea)

Nano Urea product is developed by the Sri Lanka Institute of Nanotechnology (SLINTEC). Nano Urea product has received three international patents and production license from National Fertilizer Secretariat. This product has been tested for paddy in collaboration with the DOA and four trials have been conducted at Rice Research and Development Institute, Bathalagoda. According to the research results, if Nano urea declared by SLINTEC (35% W) is applied to paddy field instead of 100% of granular urea, only 75% of Nano urea can increase the yield by 30% over the 100% of granular urea.

3. Increasing the production of high quality organic and biofertilizers requires the application of correct technologies and maintenance of quality assurance. To address this requirement, conducting large-scale surveys and research work with the participation of all stakeholders, the DOA, farmers, fertilizer manufacturers, and scientists who developed or introduced the new fertilizer types, is a vital necessity.

6 Recommendations

Considering the above observations, this Sectoral Oversight Committee is expected to arrive at the following recommendations;

1. The committee recommends that it is important first, to collect the results of extensive, farmers' field research of the new fertilizer products, which have been conducted by different fertilizer manufacturers independently or together with the DOA and other institutions.
2. As also recommended by the Director General of the DOA, if any product has not been extensively tested in the farmers' fields in different agroclimatic zones, it is important to conduct research to investigate the effects of the products on crop yield and seed quality, pests, weeds & diseases, and soil quality (especially, soil N, P & K nutrient pool dynamics at least for about four seasons, micronutrients etc.) in the different districts.

With this extensive field program in the farmers' fields, the farmers' themselves will select the new fertilizer products depending on their prices, user-friendliness, crop yield increase and profitability. This program should be conducted with the participation of the all stakeholders, i.e., the DOA, farmers, fertilizer manufacturers, and scientists who developed or introduced the new fertilizer types.

3. The fertilization program of the country will have to be revised accordingly, with the incorporation of those organic and biofertilizers, and the new recommendations will have to be developed by the DOA.
4. Based on the above, the imports of chemical fertilizers can be decreased gradually, while increasing organic and biofertilizers by encouraging local, eco-friendly fertilizer manufacturers.
5. It is important to create the necessary environment to take the new fertilizer products forward in order to minimize chemical fertilizer imports to the country.
6. The soil testing program of the DOA should be continued for agricultural lands applied with the new fertilizer types and the laboratory facilities of the DOA will have to be modernized with high tech equipment and with other resources.
7. It is essential to strengthen the capabilities of the Research and Training Centre of the DOA responsible to conduct research and training for organic and biofertilizer, in order to increase the knowledge of organic and biofertilizer manufacturers to produce high quality products.
8. The DOA should coordinate to conduct adequate research trials to confirm the quality of the products before the registration of the local fertilizer producers by the National Fertilizer Secretariat.
9. It is important to start sociological research to study what went wrong with promoting 'organic farming'; the challenges, barriers, and hurdles. Also, it is imperative to engage the wider stakeholders in this process, and also, we have to work with farmers to change their bad attitudes towards organic fertilizers. The extension program conducted by the DOA and the Department of Agrarian Development should be strengthened.
10. Formulation of new standards for technologically improved novel types of chemical, organic and biofertilizers should be prioritized and obtaining Good Manufacturing Practices Certification (GMP- SLS 1752) for production of organic fertilizers and soil conditioners by fertilizer manufacturers should be made compulsory as to assure quality fertilizer in the market.

The ongoing operational mechanism maintained by the National Fertilizer Secretariat should be further strengthened to implement the powers given by the Fertilizer Regularization Act No. 69 of 1988 to prevent the production, sale and distribution of substandard (or adulterated) fertilizers.

11. The local fertilizer manufacturers producing good quality products with the farmers' acceptance have to be protected and market avenues have to be ensured to sustain the local fertilizer industry, and the Government Fertilizer Subsidy Program that is implemented only for imported chemical fertilizers must also be extended to the organic and biofertilizers.

12. The National Fertilizer Secretariat should regulate the implementation of the fertilizer distribution process according to a plan so that the farmers can get the fertilizer at least one month before the start of the season, taking into account the timing of the start of the cropping season in each district.

Sectoral Oversight Committee meetings on Food Security and Agriculture

Policy Recommendations to Address the Issues Pertaining to Fertilizer Application Program for Agricultural crops in Sri Lanka was considered by the Sectoral Oversight Committee meetings on Food Security and Agriculture and we, the Committee Members approve this report to be presented to the Parliament for giving the Committee's recommendations.

Hon. D. Weerasinghe (Chairman) Signed

Hon. Chamal Rajapaksa Signed

Hon. C.B. Rathnayake

Hon. S.M. Chandrasena Signed

Hon. Vasudeva Nanayakkara Signed

Hon. R.M. Ranjith Madduma Bandara

Hon. Dilip Wedaarachchi

Hon. Kapila Athukorala Signed

Hon. Govindan Karunakaram Signed

Hon. Milan Jayathilake Signed

Hon. Kins Nelson Signed

Hon. Sudath Manjula

Signed

Mr. M.M.M. Mabrook, Secretary to the Committee

Annexure 1

References

Ministry of Agriculture

1. National Agriculture Policy (NAP) for Food and Feed Crops and Sustainable Food Security

Department of Agriculture

1. Fertilizer Recommendation for Rice 2013 -Department of Agriculture, Peradeniya
2. Rice Manual of soil test-based Fertilizer Recommendation for Rice - Rice Research and Development Institute, Bathalagoda -2014
3. Fertilizer Recommendation for OFCs - 14.04.2020
4. Fertilizer Recommendation for Horticultural Crops
5. Nano Urea Research Findings - Rice Research and Development Institute, Bathalagoda
6. Soil test-based Fertilizer Recommendation for OFCs and Vegetables
7. Soil Testing Laboratories and Soil testing Program
8. Mean Paddy yields (t/ha) with different Environmentally Friendly Fertilizers tested under 70% chemical: 30% organic fertilizer

National Fertilizer Secretariat

1. Chemical Fertilizer usage 2022/23 Maha Season
2. Chemical Fertilizer Requirement for the year 2023
3. Chemical Fertilizer Imports and Usage 2016-2022
4. Chemical Fertilizer Usage (Annual Average) 2016-2021
5. Chemical Fertilizer usage for Paddy Cultivation 2020-2023

National Institute for Fundamental Studies, Kandy

1. A Concise Technical Report on Biofilm Biofertilizer (BFBF)

Sri Lanka Standards Institute

1. Publishing SLSI Standards for Bio Fertilizers and Preparation of SLSI Standards for Nano Urea (HA Urea)

Annexure 2

List of Participants for the Sectoral Oversight Committee meetings on Fertilizer Application Program.

1) Ministry of Agriculture

1. Ms. K.K.A. Sunitha, Additional Secretary (Development) Fertilizer Division, Ministry of Agriculture

2) Department of Agriculture

1. Ms. P. Malathy, Director General of Agriculture
2. Dr. D.M.J.B. Senanayake, Additional Director General (Research)
3. Mr. M.S.K. Herath, Additional Director General of Agriculture
4. Dr. M.G.D.L. Priyantha, Additional Director, Center for Seed Certification and Plant Protection
5. Dr. M.S. Nijamudeen, Additional Director, Center for Sustainable Agriculture Research and Development, Makandura
6. Dr. W.A.R.T. Wickramarachchi, Director, Horticulture Research and Development Institute
7. Ms. D.S. Ratnasinghe, Director (Seed Certification and Plant Conservation)
8. Mr. S. Satheswaran, Director, Seed and Planting Material Development Institute
9. Dr. W.M.I. Weerasekera, Deputy Director, Seed and Planting Material Development Institute
10. Dr. (Ms.) W.M.U.K. Ratnayake, Chief Agronomist (Soil Science)
11. Dr. (Ms.) Priyanga Dissanayake, Assistant Director of Agriculture, Center for Sustainable Agriculture Research and Development, Makandura
12. Ms. N.R.N. Silva, Assistant Director of Agriculture
13. Mr. N.R.M. Renuka De Silva, Specialist, Horticulture Research and Development Institute

3) Department of Agrarian Development

1. Mr. A.H.M.L. Abeyrathna, Commissioner General of Agrarian Development

4) National Fertilizer Secretariat

1. Mr. Chandana Lokuhewage, Director

5) Ceylon Fertilizer Company Ltd.

1. Mr. W. L. P. V. Perera, Major General (Retired), Chairman

6) Colombo Commercial Fertilizer Company

1. Mr. Jagath Perera, Chairman

7) Sri Lanka Standards Institute

1. Dr. Asanga Ranasinghe, Chairman
2. Dr. (Mrs.) Siddhika Senaratne, Director General
3. Mr. K.A. Anil, Director (Standards)

8) National Institute of Fundamental Studies (NIFS), Headquarters in Kandy

1. Professor Athula Sumathipala Chairman NIFS (Ex officio)
2. Professor Gamini Seneviratne, Senior Research Professor in Microbial Biotechnology
3. Professor S. A. Kulasooriya, Honorary Visiting Research Professor

9) Sri Lanka Institute of Nanotechnology (SLINTEC)

1. Dr. Lakshita Pahalgedara, Head (Business Promotion)
2. Mr. Vajira Perera, Chief Executive Officer
3. Mr. Charaka Sandaruwan, Senior Research Scientist

10) Green Agriculture Fertilizer Manufacturers Association

1. Mr. Jayanath Kumarasiri, President
2. Mr. Amila Bandara, Vice President
3. Mr. Jayanath Dimitri Stephen Samarakoon, Secretary
4. Mr. Channa Ruberu, Assistant Treasurer
5. Mr. W.M.I. Dhanushka Wijesundara, Member