

I would also like to pose a question to Dr Chandra Dharma-wardena, Dr Ranil Senanayake , Prof Ananda Kulasooriya, Prof Ben Basnayake , Prof Roshan Perera, Dr Sirimal Premakumara, Prof Gamini Seneviratne or anyone on this forum, as to what their thoughts are about the following::

- The planting of LEGUME crops like MUNG ETA, which only takes about 45 days to harvest, is universally known amongst the agro scientists as a very prolific crop that adds approximately between 200 kg and 300 kg of Nitrogen to the soil, by sequestering the freely available nitrogen in the air we breathe (78%). That means, if a rice farmer or any other crop farmer, is advised to plant MUNG ETA just before the rice crop , as an inter seasonal crop, they would be able to get 200% to 300% more nitrogen into the soil for free, than what the Rice crop for example needs, which is only 110 kg of nitrogen according to the Department of Agriculture. It is a surprise that instead of providing that advice and even distributing MUNG Seeds to farmers, the Department of Agriculture advises farmers to apply UREA to even a MUNG Crop. Professor Kulasooriya at NIFS has done extensive studies on this and has run a very a large scale program using biofilm applications and other soil microbial action enhancement initiatives to achieve very good results, and therefore it begs the question as to why Mung or any other legume crop is not made mandatory in a good crop rotational plan for farmers, to secure as much atmospheric free nitrogen as possible?
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- A scientific paper published in peer reviewed journal as far back as 1987 (Nitrogen Fixation in some Rice Soils in Sri Lanka, published in the MIRCEN Journal of Applied Microbiology and Biotechnology), suggest the promotion of algae growth in the paddy field during the first 21 days of planting to obtain as much free nitrogen as possible. In fact the paper states the following: "*In situ measurements of nitrogenase activities in some rice soils, representing three different agroclimatic zones of Sri Lanka, demonstrated that there is a great potential for nitrogen fixation in these paddy soils, provided that they are continuously flooded and that nitrogenous fertilizer levels are relatively low. Under such conditions cyanobacterial (blue-green algal) fixation predominates. In certain areas of the wet zone, with highly organic soils, cyanobacterial fixation could probably meet a great part of the N-fertilizer input recommended. Heterotrophic rhizosphere fixation may also be significant, especially in the dry zone.*" Thus it begs the question once again, as to why our department of agriculture does not make a concerted effort to utilize all available scientific knowledge and proven methods to reduce to application of artificial inputs, by pursuing a natural input maximization strategy and then FILL THAT MISSING PERCENTAGE and not waste public money on EXCESSIVE application of UREA, which is also compounded by what Ashley De Vos just mentioned about the timing of the application.
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- The third and final question is about the baseline yield figures that the department of Agriculture has in its research stations about the use of both

chemical inputs and organic inputs and non application of any input at all for rice. According to Prof Mahroof, his ongoing study has shown that the initial crop yield loss for rice when a 100% chemical input rice field was converted to a ZERO input field, the first year crop yield loss was less than 17% from the original crop yield of 4.7 tons per hectare equivalent. Only in the fourth year that the yield had dropped by 45% on his test rice plots. He has further discovered that the rice yields do not drop below 2 tons per hectare. He attributes this to rainwater when it falls during thunder storms, providing a certain percentage of nitrogen from the air, which enables most paddy fields in the wet zone of Sri Lanka to sustain a rice yield minimum of 2 tons per hectare. So that means, the incremental yield that Sri Lanka's rice fields are securing through the use of artificial or natural inputs is 2.7 tons per hectare. So is it not important for Sri Lanka to look at the technology developed by Professor Nilwala Kottegoda of reducing the leaching percentage of urea and other nutrients essential for plant growth, that her team has developed to create a "slow release fertilizer", which is a much more efficient delivery method to the rice plant? Also look at the technology developed by Prof Gamini Seneviratne at the Institute of Fundamental Studies with Prof Kulasooriya to increase the soil microbes and thereby improve the nitrogen conversion into nitrate and amino acids, which also reduces the quantum of urea and other mineral inputs like muriate of potash and phosphates. Why is it that our local scientific knowledge is not taken full advantage of to develop these efficient soil nutrient management and plant nutrient management solutions?

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- Very recently, both the ITI led by Dr Sirimal Premakumara and Bio Ingredients led by Prof Roshan Perera, formerly at the University of Texas and KDU, had isolated over 24 different beneficial bacteria and microbes that can enhance the nutrient delivery of the soil to the plants and also had enhanced the plant absorption capacity at the root nodules and also as folio applications, to dramatically boost plant growth using the available nitrogen, phosphate and potash in the soil. All of these efforts are all plant based extractions and not petroleum industry by products, and as such, it is not even from the toxic municipal waste dumps, and this eliminates the potential risk of pathogen contamination, as both Prof Roshan and Prof Gamini, from their respective institutions have proven how to extract from natural plant source materials enough nutrient mobilization capable bacteria to further reduce on the dependence of artificial inputs. Again, why is the Government not taking advantage of their expertise?
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- Finally, why is that the tea industry not taking advantage of the numerous studies led by Prof Ben Basnayake on the application of soil conditioning bio charcoal, which has developed a global scientific research community that has observed very positive results in improving the nutrient retention capacity and the soil moisture retention capacity by adding bio charcoal to an agriculture field. The use of rice waste from mills and also bamboo, and even tea waste and cadju waste and even sawmill waste to produce bio charcoal to be added to

the soil. The tea industry has faced severe crop yield drops mostly because of the depletion of the soil organic matter and the inability of the sloping hills to retain applied nutrients like UREA, which would be easily captured and trapped by the bio charcoal , making a case for fertilizer delivery efficiency management. Why are these proven practices not mandated in Sri Lanka?

Thank you

With metta blessings

Chris Dharmakirti