



Customized Fertilizer

Challenge

Most farmers lack adequate knowledge about nutrient balance and sustainable soil management, leading to the widespread use of standard fertilizer formulas which are comprised of generic mixtures of key soil nutrients like nitrogen, phosphorus, and potassium. This one size fits all approach is ineffective for increasing crop yields or reducing costs, and often contributes to over fertilization and soil health degradation. Although the Thai government has promoted customized fertilizers, adoption by farmers is limited. Most farmers have the habit of applying large amounts of fertilizer instead of adjusting their applications based on soil analysis. They perceive that customized fertilizers are inferior and that their costs remain unchanged due to the extra labor required for mixing fertilizers.

Solution

Customized fertilizer allows farmers to reduce costs by adjusting the mix of mineral elements based on crop needs and soil nutritional deficiencies. This approach provides site-specific nutrient management, preventing nutrient imbalance and lowering environmental effects. Enhancing farmers' knowledge and providing them with site-specific nutrient management tools—such as soil test kits, soil property maps, and fertilizer mixers—while promoting integrated ecosystem management can enable broader adoption of customized fertilizers among farmers.

Adaptation and Mitigation

Customized fertilizer contributes as both an adaptation and mitigation measure to present-day agriculture in the face of climate change. It helps farmers to adapt to changing soil conditions based on soil analysis. This approach also mitigates the negative environmental

impacts of fertilizer utilization which contributes to climate change by reducing the unnecessary use of chemical fertilizers, which helps prevent environmental contamination, reduce the carbon footprint from the fertilizer supply chain, and reduce greenhouse gas emissions.

Expected Income Gain for Smallholder Farmers				
	Fertilizer			Notes
	Traditional	Customized	Difference	
per rai				
Yield (kg)	480	576		Estimated minimum yield increase of 20%.
Price (THB)	13	13		
Revenue (THB)	6,240	7,488	1,248	
Basal Fertilizer (THB)	625	438	188	Estimated fertilizer cost decrease of 30%.
Dressing Fertilizer (THB)	875	613	263	
			Income Gain	
			1,698	
			per rai	

Business Model

#thaiRAIN collaborates with a country-wide network of community rice centers to increase farmers' knowledge of customized fertilizer and its benefits through community-level training sessions. The centers are a type of farmers' self-managed network registered with the Rice Department that serves as a learning center and market facilitator for linking farmers with traders and millers. The centers have been trained in sustainability practices and using instruments such as simple soil test kits and customized fertilizer. #thaiRAIN provides technical and financial support to help them improve farmers' knowledge and promote the adoption of customized fertilizer. There are about 4,800 such centers in 75 provinces of Thailand.

USDA Thailand Regional Agriculture Innovation Network (RAIN) project, funded by United States Department of Agriculture Food for Progress and implemented by Winrock International, strives to facilitate adoption of 30 climate smart innovations by 30,000 farmers.

For more information, visit <https://winrock.org/project/using-tech-to-support-thailands-transition-to-climate-smart->