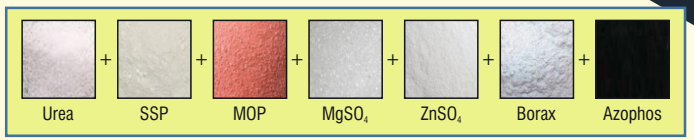
Single form fertilizer

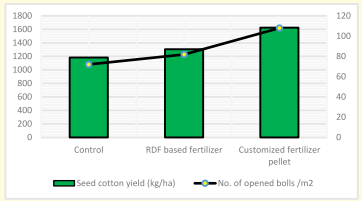


Customized fertilizer pellet

Balanced fertilizer application

High response and improved plant attributes

Achieved higher yield (24.6 % increased SCY)



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Development of Customized Fertilizer Pellet for Cotton Production

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Introduction

- Cotton is an important cash crop but it is considered as a nutrient depleting crop due to high biomass accumulation and nutrient uptake rate. Moreover, nutrient management for cotton is a complex phenomenon due to simultaneous production of vegetative and reproductive parts at their active growth phases.
- At this juncture, injudicious or imbalanced application of fertilizers *ie.,* over and under fertilization results of impairing the potential yield of cotton.
- Optimizing the fertilizer nutrients based on soil and crop response studies is an important approach for enhancing the cotton productivity and farm profitability under different soil conditions.
- Achieve the balanced nutrition in crops is not so facile without modifying the fertilizer product and hence custom made fertilizers *ie.,* customized fertilizers are identified.
- Customized fertilizers (CF) are multinutrient carriers that contain macro, secondary and micro-nutrients from both inorganic and/or organic sources to promote the balanced fertilization, provide the site specific nutrient management, satisfy the crop's nutritional demand, maximize the fertilizer use efficiency, minimize the unwanted impacts on the environment and improve the benefit-cost ratio.

Formulation of customized fertilizer for cotton

- For cotton crop, customized fertilizers are formulated by considering the fertility status of the soil through soil and crop response studies in a particular region.
- Major fertilizer nutrient requirements secondary and micronutrients combinations biofertilizer like Azophos were mixed to formulate the customized fertilizer.
- Pelletization process was standardized by mixing of different types of organic based binding material with different ratio and then, suitable binding material was chosen based on the characterization of pellets like diameter, thickness, average weight of the pellet, pH, EC, solubility rate and no.of pellets produced per hectare.
- The newly designed fertilizer pellets are smooth, uniform and glossy surfaced and used for both basal and top dressing application.

Effects of customized fertilizer on cotton production

- Field experiment was conducted during the year 2023-24 at Central Institute for Cotton Research (ICAR – CICR) to evaluate the newly developed site/soil specific customized fertilizers on cotton variety suraksha.
- For basal fertilizer application, combinations of half of N and K, full dose of P and double dose of secondary and micronutrients along with biofertilizer (2 kg /ha) were pelletized and then required quantity of pellets were applied around each plant.
- The remaining half of N and K were splitted into two parts and were pelletized for top dressing application.
- Seed cotton yield was increased by 24.6 per cent due to application of customized fertilizer pellet than generally applied recommended dose of fertilizer.

Benefits of customized fertilizer

- Application of customized fertilizer is very simple and easy than conventional and can provide all the nutrients to satisfy the nutrient requirement of the crop
- Nutrients were distributed uniformly in the root zone
- Combined form of macro, secondary and micro nutrients are in one pellet, so no additional cost is required to purchase the micronutrient fertilizer separately
- Crop yield maximization was achieved per pellet application
- Ensured the balanced fertilization and reduced the nutrient depletion in soil.