REEL Programme

Soil Testing – Process Documentation

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Context on soil testing

Soil provides not only the medium but also functions as the source of these nutrients for the plants. Higher crop yields and quality of the crops depend largely on the efficient supply of nutrients. Soil resources get depleted with every harvest and need to be replenished for every crop. However, one must know which nutrients are depleted to what extent and what addition of fertilizers should be planned accordingly. Soil analysis, in this regard, helps in determining the level of nutrients and in deciding the required amount of fertilizer application. Accuracy of soil analysis is directly related to the quality of the soil sample taken. Application of appropriate fertilizers with the proper nutrient mix will help not only to increase the productivity and farm income but also provide a more realistic chance to obtain the desired yield.

Soil testing methodology:

- Samples from each village (minimum 5 samples) from different locations/ farmers randomly selected which would be considered as a representative sample for the respective village.
- Considering remote geographic locations across regions, use movable authenticated soil testing kits reached to the respective location.
- The soil testing should be taken care by the agronomist and project coordinator with proper guidance of soil testing experts.
- Random checks with standard soil testing protocols from recognized laboratories will be ensured to ensure authenticity of results
- The results of soil testing would be interpreted for fertilizer recommendations by govt certified agencies/bodies of the respective state.
- Every soil sample should have date of sample collection, previous crop grown, date of collection, Latitude/Longitude and irrigated/rainfed information

Timeline:

The optimal timing for soil sample collection is when the field is without a standing crop, either in the spring before planting or after harvesting of the crop. Both of these periods are valuable for a comprehensive management Programme. When deciding on the timing for soil sample collection, we consider the following factors:

- Gather soil samples during the end of the fallow period by following the standard soil sampling procedure.
- In areas with standing crops, collect samples between rows.
- Schedule soil sampling and testing before the application of fertilizers or lime.

- Collect samples with enough lead time for the laboratory to analyze the data.
- Maintain consistency in sample collection timing to minimize year-to-year variability.
- For most soils, we aim to sample fields once every four years. However, the frequency may vary based on soil type; for instance, sandy soils or highly managed soils (e.g., irrigated fields, silage or hayfields, etc.) may require sampling every two years due to the rapid changes in soil fertility in these conditions.

Areas we avoid when collecting soil samples:

Irrespective of the chosen soil sampling approach, it is important to exercise caution when selecting sample collection sites in the field. Certain areas need to be avoided due to potential disruptions in natural variation, making the soil at these points unrepresentative of the broader soil characteristics in a field or zone. If the chosen soil sampling location falls within or in close proximity to these problematic areas, we consider relocating the sample point to a more suitable location. If problem areas occupy substantial portions of a field (i.e., larger than 5-10 acres) we consider sampling each problem area as a unique zone.

- End-rows or areas with heavy equipment traffic
- Wet spots or depressions or near irrigation/drainage channels
- Highly eroded regions
- Sites of former farmsteads or animal enclosures or where FYM/compost was dumped/off-loaded for subsequent spreading
- Locations within 100 ft. of roads
- Areas where lime is stored before application
- Avoid areas near trees, compost pits, recently fertilized plots or other spots where soil composition may be uneven.

About soil testing authenticity

The approved soil testing kit with Laboratory Accreditation from Indian Institute of Social Science (IISS, ICAR) should be used in India. Similarly approved kits should be used in other geographies. It should be ensured that the kit is calibrated and validated for the target locations and validation results are provided to the Local Implementation Partners (LIPs).

Report for capturing soil testing results

Soil testing results should be recorded in suggested format, and these results will be shared with CottonConnect team for data verification and further interpretation with suggestive recommendations given by experts/ expert agencies.

Way Forward

- Soil testing results will be interpreted with state/ regional wise recommended dose of NPK (%) for cotton crops by respective KVKs/ State Agriculture University/Expert Institutions. In addition to that, recommended fertilizers dose quantity wise categorized by using classification of soil test values as per 3/5/6 tier system.
- The automated soil testing calculation sheet (in excel) should be used for deriving recommended fertilizer dose (Kg/ ha) for individual farmers.
- Mentioned recommended dose for each state (RFD) for NPK and corresponding Urea/SSP/DAP and MOP should be calculated accordingly
- Based on recommended fertilizer dose (Kg/ ha), soil health card will be produced which shows split dosage with 2 best recommendable options given in Kg/ ha.
- By using normalization technique, we will arrive with common fertilizer dosage by village wise. This reaccommodated fertilizer dosage will be helpful to the remaining farmers who will be part of the Programme.
- Soil health cards will help to ensure balanced fertilization, improve crop productivity and soil health

Soil Testing and Governance

Soil health management and soil testing at village level is one of the most important interventions under the REEL Programme with the aim of promoting location wise soil testing with specific focus of cotton crop and soil health management and wise application of fertilizers. Under soil health management, soil testing is one of the key components with an objective to improve timely testing and analysis of soil samples and this will minimize the delays and maximize the convenience to farmers. The soil testing results are provided and facilitated to farmer at their door step.

The critical input from in improving the soil test-based fertilizers use improve the quality of work being done by the LP team.

- By this way, Programme help in increase the fertilizer uses efficiently, reduce the cost of cultivation, improve crop productivity and farmers income.
- The periodical decisions at different levels indicate the quality and success of the program for the better governance.