

Introduction to Crop Monitoring



Crop yield is determined long before the crop sets seed. It is the culmination of how the crop performed during each stage of growth-establishment, seedling growth, tillering/branching, flowering and grainfill. Monitoring the agronomic factors that are responsible for achieving profitable and sustainable yields is essential if farmers of the Indo-Gangetic Plains (IGP) are to improve their competitiveness in an economy that is characterized by escalating costs, variability in grain prices, and diminishing returns.

By identifying limitations to crop growth, action can then be taken to address such issues before significant losses occur, for increasing crop production and profitability. Crop monitoring allows farmers to be pro-active rather than reactive to factors affecting crop performance. Most farmers carry out some form of assessment of their farming systems. For example, simple measurements such as the volume and frequency of irrigation and/or rainfall allows farmers to determine likely crop yields. Assessing weed types and densities may help in deciding the type and concentration of herbicide to be applied, or the number of tillage operations that are to be performed. Final crop yield is a reflection of the effectiveness of the decision-making process and an overall indicator of crop performance.

Comparing Crop Performance

Monitoring of crops as part of a local neighborhood farm group activity allows farmers to compare the performance of their crops with others in their group, village, and district. This process is called comparative analysis. Crop monitoring is done at different stages of crop growth. At each stage, a wide range of factors are monitored. Measurement of these factors and comparing them to standards of the district help determine whether the crop is performing at an optimum level.

Monitoring through On-farm Participation

Participation in crop monitoring activities provides farmers an opportunity to develop skills in assessing crop performance, and in turn identify opportunities for improving crop yield and crop rotation performance. Through crop monitoring, it is possible for farmers to evaluate changes that are made in their cropping management so as to determine the suitability of a new technology, and to modify existing farming practices. By developing a crop monitoring system with local farmers having a common farming environment, it is possible for them to share ideas and experiences with others, as well as having direct access to technical and research expertise from research and extension officers who may be involved in facilitating the activities.



Benefits of Crop Monitoring

Activities		Benefits
Identify factors that limit crop production and introduce management practices to maximize water use efficiency, crop yield and seed quality.	CROP	<ul style="list-style-type: none"> ● Identification of major constraints to crop production ● Water use efficiency of the crop ● Crop yield and profitability
Observe the performance of the crop on the farm and in the neighborhood so as to establish standards for optimum plant density and critical thresholds of insect pests prior to management treatments.		<ul style="list-style-type: none"> ● Crop yield and profitability
Tackle specific issues such as diseases, insect pests, weeds, herbicide resistance, nutrient imbalance and decline in soil fertility.	SOIL	<ul style="list-style-type: none"> ● Knowledge of major biotic and abiotic constraints as well as potentially important constraints ● Knowledge of soil fertility
Evaluate new cropping systems, new crops, and new crop rotations and select appropriate practice for individual fields.		<ul style="list-style-type: none"> ● Knowledge of the crop rotation history of the field ● Indication of the sustainability of the cropping system
Discuss and examine new technologies and their integration into the existing farming systems, e.g., zero-tillage and integrated weed management.	ROTATION	<ul style="list-style-type: none"> ● Comparison of new technologies with existing practices ● Farmers gain confidence in decision-making

Developing a Monitoring Program for Farmers

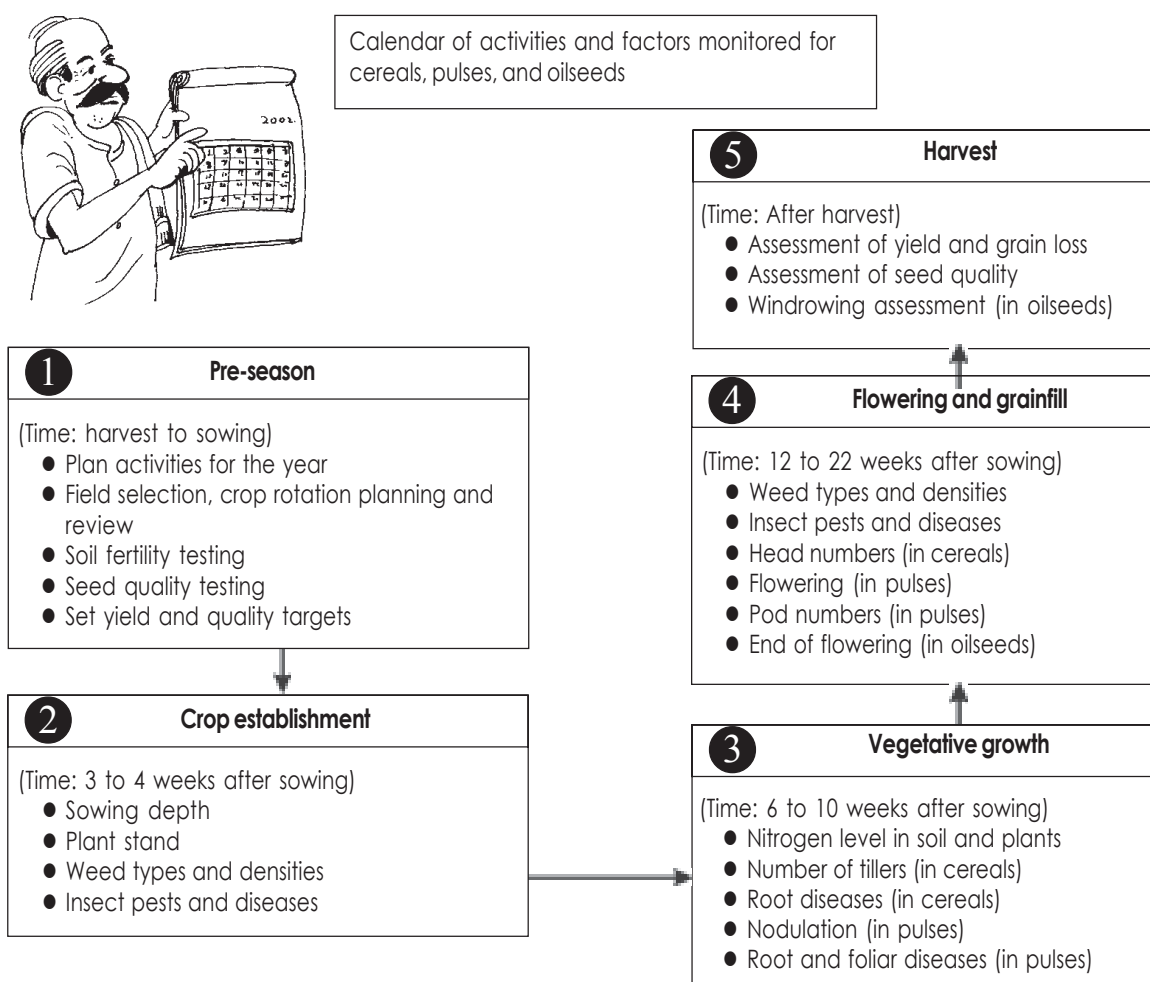
The degree of sophistication of a monitoring program developed for farmers can vary according to the skills of the farmers, and the time available to them to carry out the field monitoring activities. Although monitoring of crops forms an important part in the monitoring program, the group discussion and interaction that follows is also of great benefit to those involved, both farmer and researcher or extension officer.

Field walks and group meetings can be held throughout the year. These meetings provide opportunities for:

- pre-planting discussions (cropping patterns, fertilizer treatments and soil test results);
- reviewing activities undertaken during the year (weed control, management of pests and diseases, and irrigation practices); and
- post-harvest discussion and interpretation of results (introduction of new technology).

When field walks and group meetings are conducted, farmers should be encouraged to ask questions, and openly discuss issues with each other and the researcher. At the end of the discussion, or inspection of a crop, observations and recommendations should be summarized for future management of that crop. This will help to provide a “take home message” for the farmers involved.

Developing a Crop Monitoring Calendar



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