



Phytomonitoring: A New Way to Farming

Surender Mittal¹,
Rupakshi^{2*} and
Vinod Kumar³

^{1,3}Krishi Vigyan Kendra,
Faridabad (CCSHAU- Hisar)

²Department of Horticulture,
MHU- Karnal



Open Access

*Corresponding Author

Rupakshi*

E-mail: dr.rupakshi01@gmail.com

Article History

Received: 16.06.2021

Revised: 12.07.2021

Accepted: 15.07.2021

This article is published under the terms of the [Creative Commons Attribution License 4.0](https://creativecommons.org/licenses/by/4.0/).

INTRODUCTION

Phytomonitoring is the direct monitoring of growing plants whose main aim is to improve the controllable crop factors. It will change the way growers work as it focuses on precision agriculture and provides the essential information about the physiological conditions of the crop. Phytomonitoring methodology includes plant-sensing techniques, sampling rules, measurement protocols, data interpretation and crop-specific application techniques. The overall concept is embedded in modern electronics, data acquisition and communication systems, software and internet enabled interfaces.

The phytomonitoring technology combines:

1. Data acquisition system based on specific sensors
2. Data processing software that presents measurement information in the context of plant physiology and agronomy.

Role of the Phytomonitoring in Modern Horticulture:

Phytomonitoring is a special real-time information system, which aims at higher efficiency and lower impact on the environment. The purpose of its application is to obtain new crop information to support decision-making processes for climate (where applicable) and irrigation control. Typically, this is based on direct observations (also made using equipments) and available laboratory tests. Phytomonitoring has become an exceptionally responsive and informative real-time feedback channel between a grower and cultivated crops, complementing and re-evaluating the traditional methods.

Appropriate Requirements:

1. Management of soil and crop based on the specific conditions (Precision Horticulture).
2. Timely application of water and fertilizers.
3. Ability to quickly and remotely view the current crop status as well as its recent trend.

4. A single computerized information channel, which replaces a variety of disconnected information sources about the current crop status and growth.
5. Reliable and low maintenance sensors and systems for remotely assessing the physiological condition of the crop.

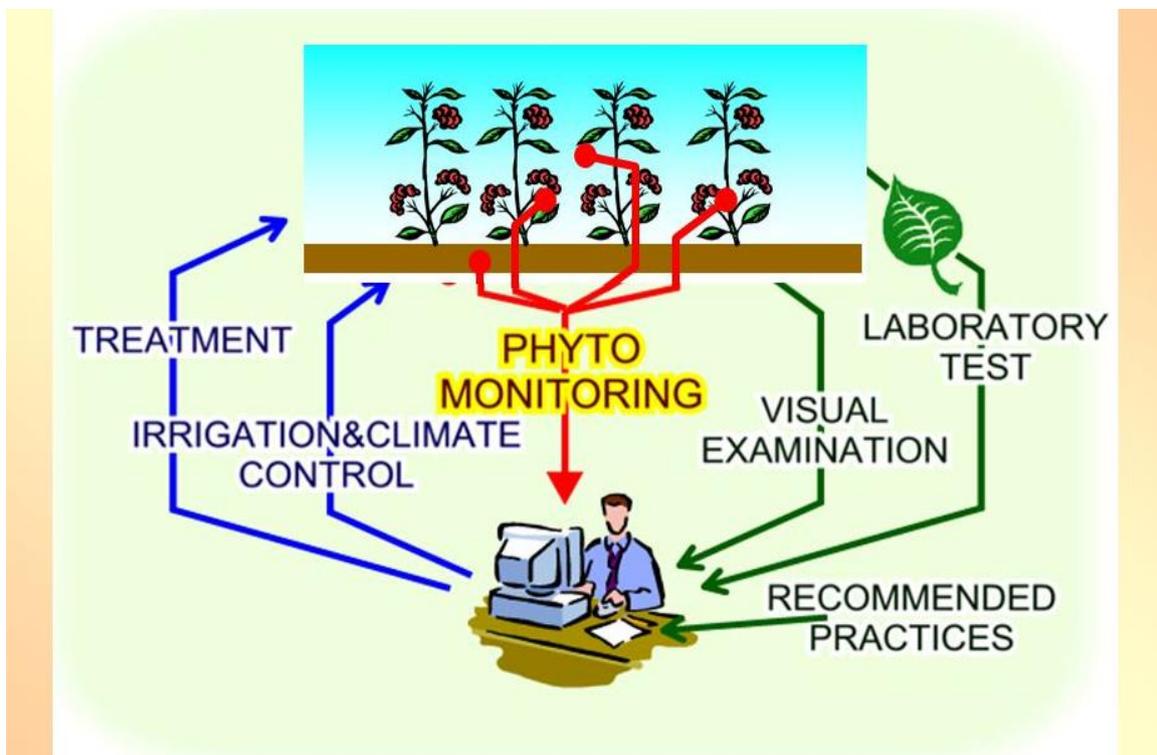
Main functions of the phytomonitoring information system: Phytomonitoring is a management information system for growing crops which has three main functions:

1. **Standard reporting:** It can generate a customized set of measured values and their derivatives, used by a producer in daily control exercise.

2. **Exception reporting (warning):** The system helps in the early detection of unexpected disorders in plants.
3. **Decision-support system:** It enables to fix climate and irrigation system, thus eliminating the risk of crop loss.

Role of phytomonitoring technology in plant growing:

- 1) To alert the grower in case of upcoming crop problems long before they become visible.
- 2) To look into the crop treatments and control operations with respect to the improvement in the crop condition.



How many plants are used for phytomonitoring?

Phytomonitoring interpretation techniques are primarily based on the analysis of trends, which are much more representative for a uniform crop than full crop characteristics. Typically a phytomonitor set includes a single set of environmental sensors and a double set of sensors related to main plant. This means that only two plants can be used as driving ones at a uniform plot.

Phytomonitoring Benefits:

- More yield can be grown in less area by using half the water.
- Irrigation scheduling based on trunk daily contraction.
- Reduction in water pollution by minimising the use of chemicals.
- Detection of plant physiological disorders at early stages of their development.
- Tracing the possible causes of crop problems by identifying their source.

- Identifying the environmental conditions that lead to the development of a particular disease.
- Sustainability and profitability of growing crops by reducing the loss of yield and quality due to improper use of controllable factors (i.e. irrigation system), late response to harmful environmental changes (i.e. wind drought), excessive inputs to crop production (i.e. overwatering), providing a unique opportunity to test some new treatments or systems only on driving plants at first, before applying them to the entire crop.