

IOT IN AGRICULTURE - FERTILIZOMETER

Fertilizers enhance the growth of plants. This goal is met in two ways, the traditional one being additives that provide nutrients. The second mode by which some fertilizers act is to enhance the effectiveness of the soil by modifying its water retention and aeration.

SOME PROBLEMS FACED

The distribution of fertilizers has to be made according to the crop which needs to be fertilized, the type of soil, and the type of fertilizer. If this doesn't happen, crops can face:

- Yellowing and wilting of lower plant leaves
- Browning of leaf margins and tips
- Crust of fertilizer on soil surface
- Black, brown or rotting roots
- Slow to no growth
- Leaf drop

CAUSES OF THESE PROBLEMS

- Lack of enough education
Study suggests that about 58% of the farmers cultivating crops don't have proper knowledge about the particular fertilizer being utilized on that particular crop.
- Excess Amount
Fertilizer burn can occur when too much fertilizer is applied, resulting in damage or even death of the plant.
- Deficient Amount
Any less than that and the crop will decrease in size and won't provide the required nutrients as much

UNIQUE VALUE PROPOSITION OF FERTILIZOMETER

This product,

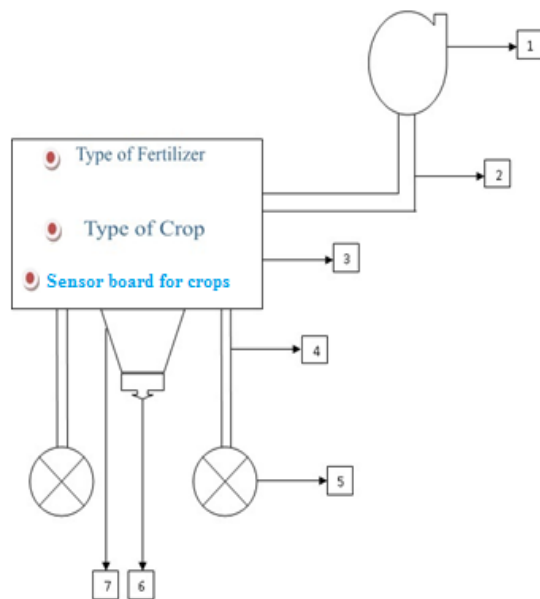
- Provides proper amounts of fertilizers to the required crops.
- Ease in working
- Ensures proper growth of the crop, without having to worry about the adverse effects of improper fertilization.

SOLUTION USING IOT

The amount of fertilizer to be provided majorly depends on the type of soil in which the crop is grown, along with the state of fertilizer (solid or liquid), and the type of crop (which seasonal crop is being fertilized).

- Fertilizometer is a machine which contains a selection box, which allows the farmer to select the type of fertilizer which the farmer is going to use, and the type of crop growing in the field.
- Along with these two, a sensor board is attached in the selection box, on which we have to place samples of the field soil, on which the said crop is going to grow.
- The soil needs to be spread on this board, so that the sensor senses the type of soil. Sensing the type of soil means sensing the already present chemicals, environmental bacteria, and the natural moisture in the soil.
- This needs to be done after every four hours in a day, which means, the soil on the sensor board needs to be changed six times in a day. This is required for the sensor board to get enough data that it needs to, about the type of soil. (This needs to be done only once during the entire season of the crop being grown, so that proper data about the crop's temperature, moisture and bacteria is collected based on the time of the day.)

- After this, with the help of Internet of Things, the data collected by the sensor after every four hours will be available on the phones or computers. This data is automatically analyzed by the computers, and the analyzed data is sent back to the Selection Box.
- In the Selection Box, the analyzed data of soil from the computers, the type of fertilizer and the type of crop, all act as factors in calculating the proper amount of fertilizer to be put on the crops uniformly.



LABELLING:

1. Container containing the required fertilizer
2. Tube thorough which the fertilizer passes into the Selection Box
3. Selection Box where the type of fertilizer is selected: solid or liquid; as well as the type of crop is selected, which automatically decides the amount of fertilizer that each plant of the selected crop needs.
4. Wheel Supports
5. Wheels
6. Distributer knob
7. Container where selected quantity of fertilizer is stored before it is passed on to the distributer knob

- This machine drops the calculated fixed amount of fertilizer that a respective crop needs, no amount more or less than that.
- Fertilizers vary in their tendency to burn, roughly in accordance with their salt index.
- The machine (which is in the form of a two-wheeled cycle) can be moved throughout the field, and every single crop can be fertilized according to its required amount.

ADVANTAGES OF USING THIS PRODUCT

By making use of this product,

- Farmers will be able to provide proper amounts of fertilizers to the required crops.
- It provides ease in working as well as ensures proper growth of the crop, without having to worry about the adverse effects of improper fertilization, which may lead to loss of crops, government interference in insurance of the crops and the livelihood of the farmers.
- Less mental stress on farmers
- Much healthier crops.