A Quick Guide to our AI Model

❖ Context

Precision agriculture is in trend nowadays. It helps the farmers to get informed decision about the farming strategy. Here, I present you Crop Recommendation Model to recommend the most suitable crops to grow in a particular farm based on various parameters. This will help you reap the best harvest possible.

❖ AI Model

Our model has a 99% accuracy and it takes into consideration the most important factors that can influence your crop yield and production.

❖ How To Get The Soil Tested?

- Deciding on how to conduct a soil test, you can choose any options:
- Do it yourself with special kits.
- Send samples for a professional analysis to a state or private laboratory. Soil test procedures in some local labs are free.
- Hire a company that will cover the whole process from sampling to field amelioration recommendations.

❖ Overview of the data entries

So let's start by introducing each and every element that you need to fill out and why:

- N - ratio of Nitrogen content in soil
- P - ratio of Phosphorous content in soil
- K - ratio of Potassium content in soil
- temperature - temperature in degree Celsius
- humidity - relative humidity in %
- ph - ph value of the soil
- rainfall - rainfall in mm

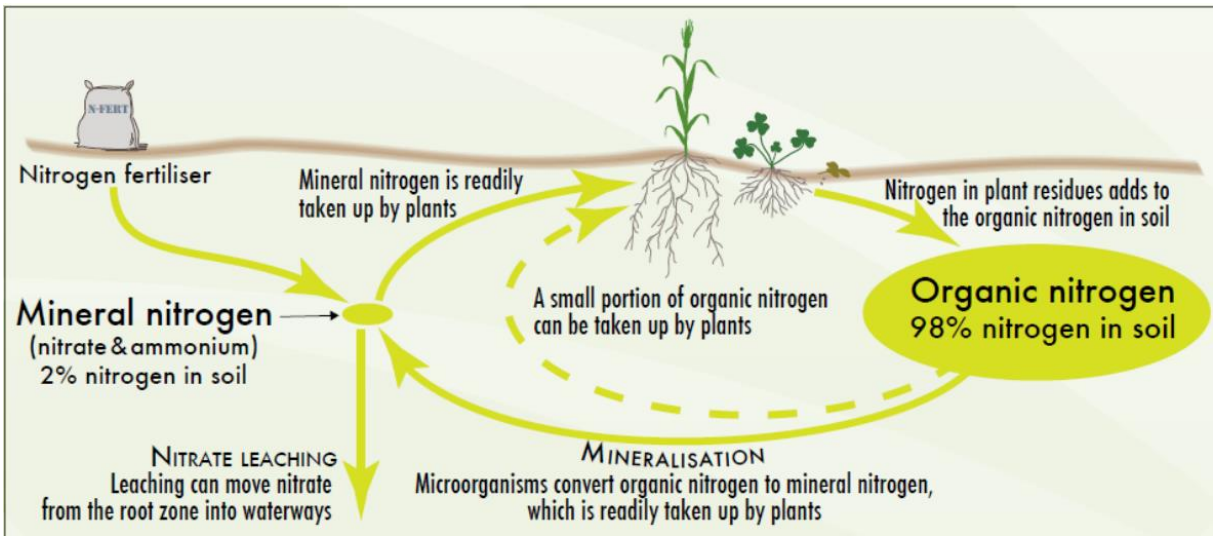
Rating Chart for Soil Test Data

Nutrient	Low	Medium	High
Organic carbon	< 0.5 %	0.5 - 7.5%	> 0.75%
Available nitrogen (N)	< 240Kg/ha	240- 480kg/ha	> 480Kg/ha
Available Phosphorus (P)	< 11.0 Kg/ha	11 – 22 Kg/ha	> 22 Kg/ha
Available potassium (K)	< 110Kg/ha	110-280Kg/ha	> 280Kg/ha

- Details about our data entries
    1. Nitrogen

Plants require more nitrogen (N) than any other nutrient but only a small portion of the nitrogen in soil is available to plants; 98 % of the nitrogen in soil is in organic forms. Most forms of organic nitrogen cannot be taken up by plants, with the exception of some small organic molecules.

In contrast, plants can readily take up mineral forms of nitrogen, including nitrate and ammonia. However, mineral nitrogen in soil accounts for only 2 % of the nitrogen in soil. Soil microorganisms convert organic forms of nitrogen to mineral forms when they decompose organic matter and fresh plant residues. This process is called mineralization.



So you don't know exactly the ratio of Nitrogen content in your soil.

For example, the required nitrogen concentrations depend on the soil type and are the highest for clay fields:

- sandy earths (25 – 50 mg-N/kg);
- loam earths (50 – 75 mg-N/kg);
- clay earths (75 – 125 mg-N/kg).

2. pH

Proper pH in the field is essential for plant productivity, and either too high or too low pH will adversely affect crop growth. Testing pH of soil, one calculates its hydrogen ions. pH values may range from 0 to 14. The neutral value is 7, lower levels are for acidity, and higher than 7 mean alkalinities. Acidic or alkaline fields are treated correspondingly. For example, pH can be raised with lime, and an accurate pH test helps determine its required quantity.

So you don't know exactly the ph level in your soil.

➔The table below will guide you to make the right choice.

Soil Types	pH
Acids	< 6.0
Normal to Saline	6.0 to 8.5
Tending to become Alkaline	8.9 to 9.0
Alkaline	> 9.0

3. Rainfall

Soil is also greatly affected by rainfall. If it is too wet or too dry, nutrients in the soil can run off and not make it to the plants' roots, leading to poor growth and overall health. Additionally, as mentioned previously, overwatering or too much rain can also lead to bacteria, fungus, and mold growth in the soil.

So you don't know exactly the percentage of rainfall level in your soil.

You can google it easily:

Just type rainfall percentage + your location or search a precipitation map such as:

https://www.wunderground.com/maps/precipitation/daily

4. K

K factor is soil erodibility factor which represents both susceptibility of soil to erosion and the rate of runoff, as measured under the standard unit plot condition. Soils high in clay have low K values, about 0.05 to 0.15, because they resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have a moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are most

erodible of all soils. They are easily detached; tend to crust and produce high rates of runoff. Values of K for these soils tend to be greater than 0.4.

Refrences :

http://www.iwr.msu.edu/rusle/kfactor.htm#:~:text=K%20factor%20is%20soil%20erodibility,because%20they%20resistant%20to%20detachment.

https://link.springer.com/article/10.1007/s10021-016-9958-1