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RESEARCH ARTICLE

Prediction Of Crop Monitoring Indices (NDVI,MSAVI,RECI) And Estimation Of Nitrogen Concentration On Leaves For Possible Of Optimizing the Time of Harvest With the Help of Sensor Networks In Guntur Region ,Andhra Pradesh , India. With agent based modeling

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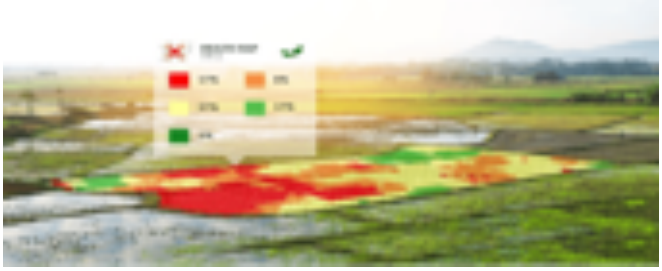
Abstract

This paper shows the utility of natural sensors for the observing of crop from a distance in a greenhouse. The work joins the instrumentation methods with the information-based framework. Agriculturalists can know the state of plants and crop output. Traditional methods only focus on crop growth and its yield. To help landowners, we planned a specialist-based crop observing framework. This examination aims to focus on a specialist-based framework to assist the agriculturists with checking the yields from a distance by utilizing the satellite imaging technique. The framework is separated into principal two fundamental parts. The initial one is information procurement and the other one is the proposal part. The readings of vital ecological boundaries are taken and turned into a simulation. Variety handling procedures are utilized to track down the nitrogen lack in the green plants this technique will give adequate data about future situations of nitrogen content in the plants.

Keyword: remote sensing, agent based modeling, wireless sensors, vegetation indices

GRAPHICAL ABSTRACT

Application of gis in agriculture



Application of agriculture sensors

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Introduction

1.1 NDVI (normalized difference vegetation index)

It is a vegetative list which is determined way as per the manner in which a plant reflects and retains sunlight based radiation at various wavelengths.the record shows trouble spots of the field at various phases of plant development. consider regarding the regions where ndvi values contrast impressively. for instance the areas of field that have a very low NDVI rate might show issues with irritations or plant sicknesses and regions with an unusually high NDVI signalize the event of weeds

1.2 NDRE (NORMALISED DIFFERENCE RED EDGE): is a mark of photograph of a vegetation cover used to gauge nitrogen focuses in plant leaves it permits you to distinguish the vegetation and is utilized to recognize plant infections

1.3 MSAVI (modified soil vegetation index): is a vegetation that permits you to decide the presence of vegetation in the soil.

1.4 RECI: (Red Edge Chlorophyll Index) is a photosynthetic of a vegetative cover, to the substance of chlorophyll in leaves .since the degree of chlorophyll is connected with the degree of nitrogen in the harvest .the record permits you to recognize the region of the field that have yellowed or blurred leaves ,which might require extra compost application

1.5 NDMI (normalized distinction dampness file): portrays the water pressure in plant which ranges from +1 to -1

Literature Review

Vegetation records - the foundation of satellite harvest checking Satellite observing permits to survey the yields' condition without the need of individual visits in the fields routinely. Vegetation are the essential apparatus that gives close constant data about the harvest condition. A satellite-based evaluation could be both subjective and quantitative assessment, and hence gives more genuine data than potential vegetation maps, which depend on vegetation-climatic elements.

Materials & Methodology

Vegetation indices utilize explicit properties of various surfaces appeared by different reflectance and ingestion of electromagnetic radiation estimated with satellites. Likewise, a rural harvest might have simultaneously various qualities inside a solitary field. That can rely upon whether it is found - in the shade of a backwoods (with an absence of daylight), in a waterlogged region (an excess of water prompting vegetation passing) or where the proportion of daylight, The critical part of making indicesis the element of satellites, which measure all the various frequencies, with ***multispectral and hyperspectral sensors***, offers 13 unique frequencies, some of them extraordinarily intended for vegetation monitoring.Each of the records utilizes a blend of values estimated at various frequencies simultaneously and in a similar spot to decide the expected boundaries. Fig 1 shows gis map of andgra Pradesh region Guntur.table 1, table 2, table 3 showing the mean indices . fig 2, fig 3 ,fig 4 shows different contours

Figures

Figure 1 shows the contour map of Andhra Pradesh Guntur region

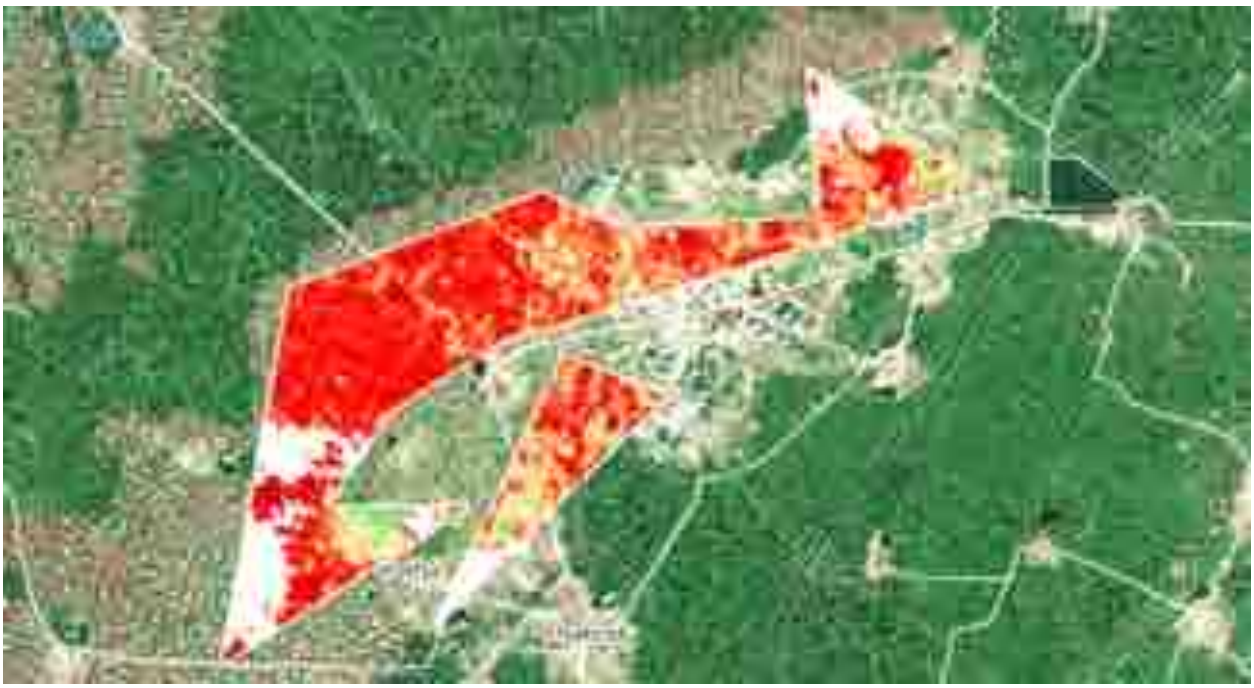


Fig2. shows NDVI with multiple contours

Fig 3. shows ndri indices

Fig 4 shows MSAVI indices

Tables

Table 1 shows mean NDVI the dense vegetation indices

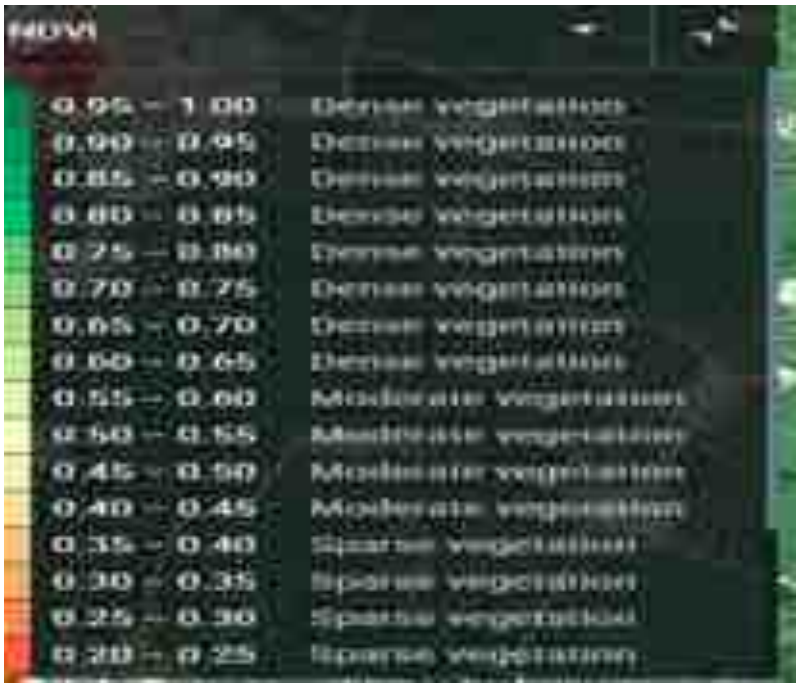


Table 2 shows NDRE mean indices

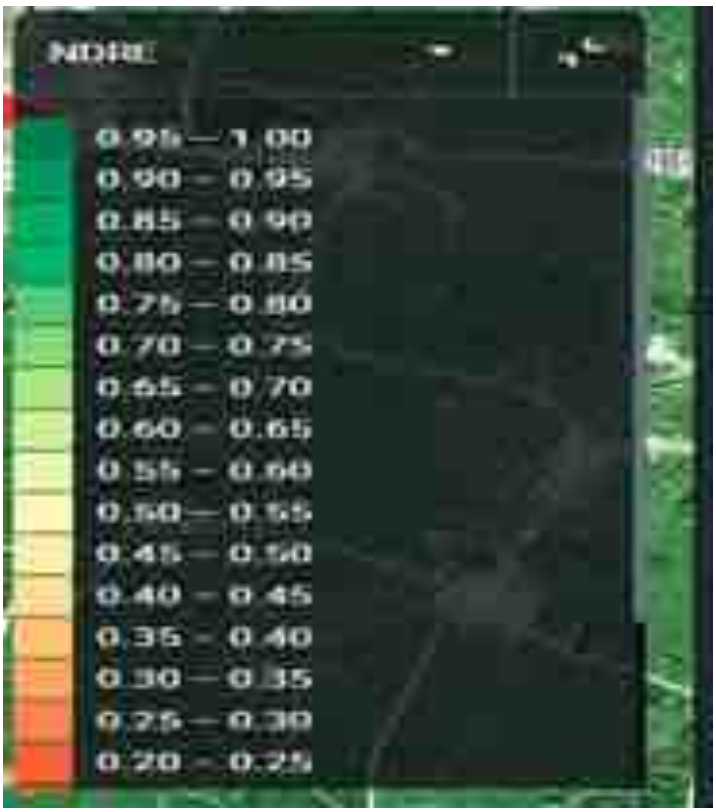


Table 3 shows MSAVI mean indices

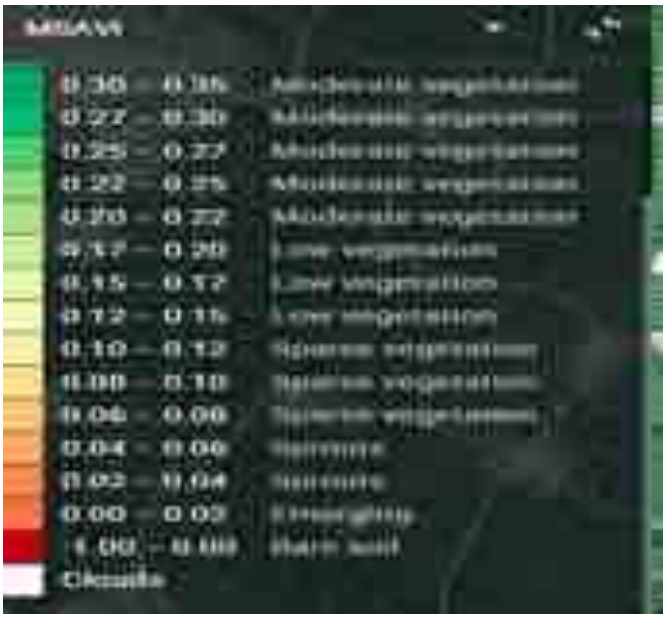
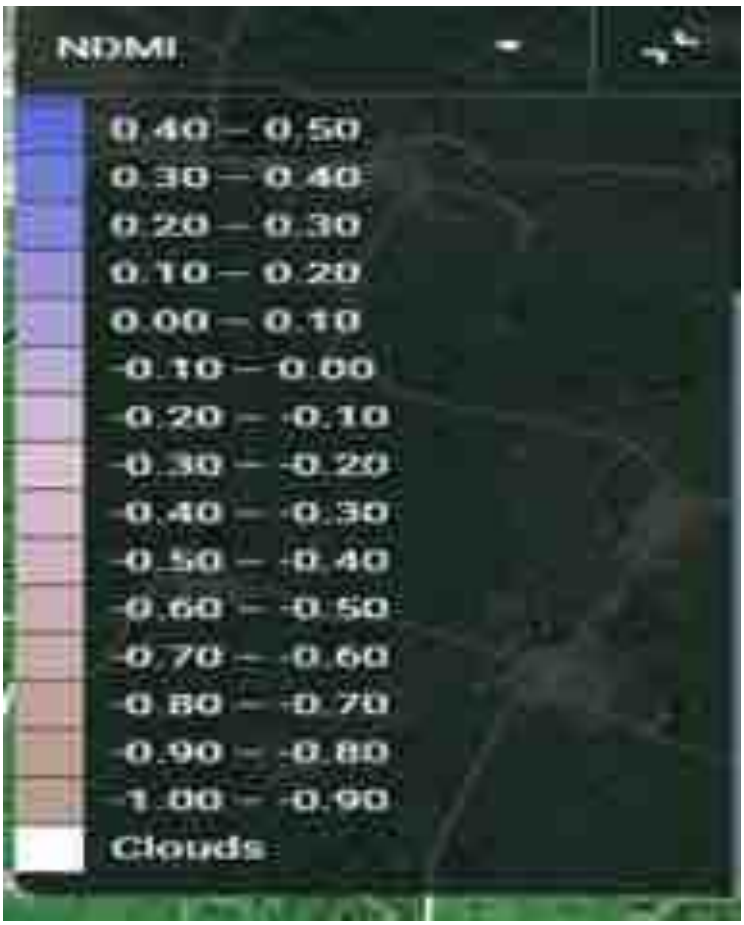


Table 4 shows MDMI mean indices



Simulation Results & Discussion

Table 5 showing vegetation indices dense,moderate ,sparse ,sprouts

INDICES	ndvi		MSAVI	
density	0.95	1	0.45	0.5
desnse vegetation	0.9	0.95	0.42	0.45
desnse vegetation	0.85	0.9	0.4	0.42
desnse vegetation	0.8	0.85	0.37	0.4
desnse vegetation	0.75	0.8	0.35	0.37
desnse vegetation	0.7	0.75	0.3	0.35
desnse vegetation	0.65	0.7	0.27	0.3
desnse vegetation	0.6	0.65	0.25	0.27
moderate vegetation	0.55	0.6	0.22	0.25
moderate vegetation	0.5	0.55	0.2	0.22
moderate vegetation	0.45	0.5	0.17	0.2
moderate vegetation	40	0.45	0.15	0.17
sparse vegetation	0.35	40	0.12	0.15
sparse vegetation	0.3	0.35	0.1	0.12
sparse vegetation	0.25	0.3	0.08	0.1
sparse vegetation	0.2	0.25	0.06	0.08
sprouts	0.15	0.2	0.04	0.06
sprouts	0.1	0.15	0.02	0.04
emerging	0.05	0.1	0	0.02
bare soil	0	0.05	-1	0

Fig.5 showing moisture with ndvi

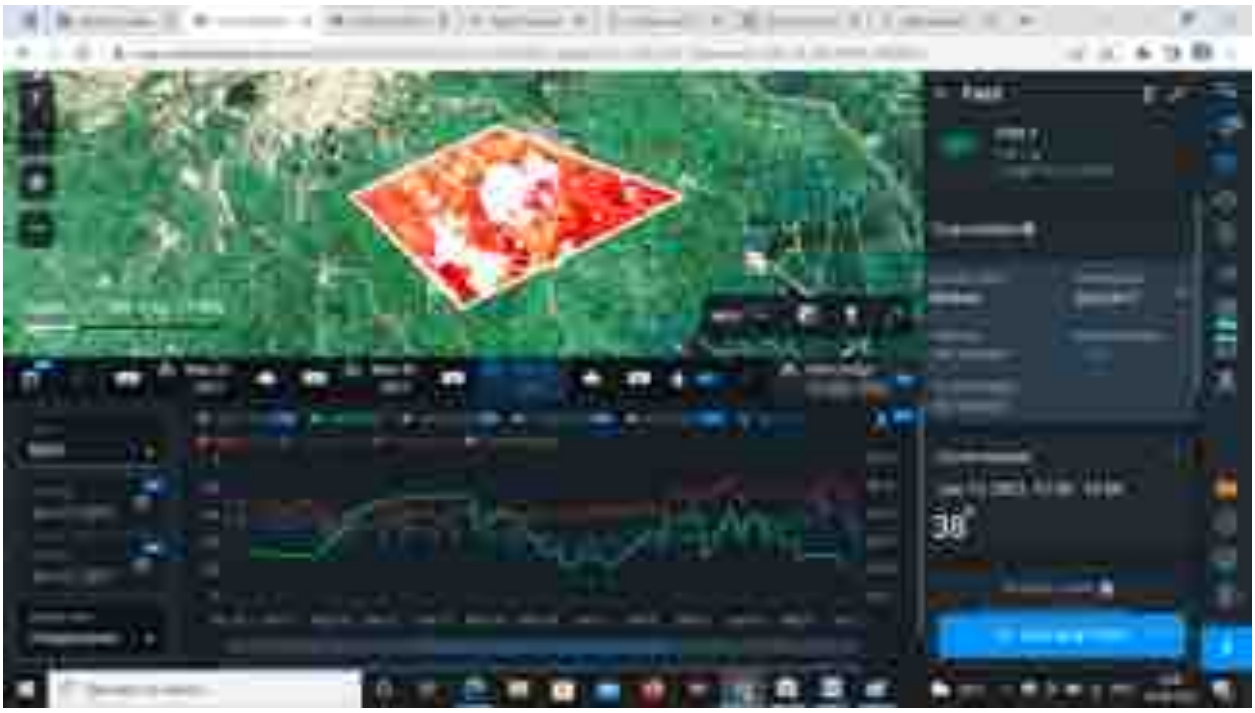


Fig 6 showing temperature with ndvi

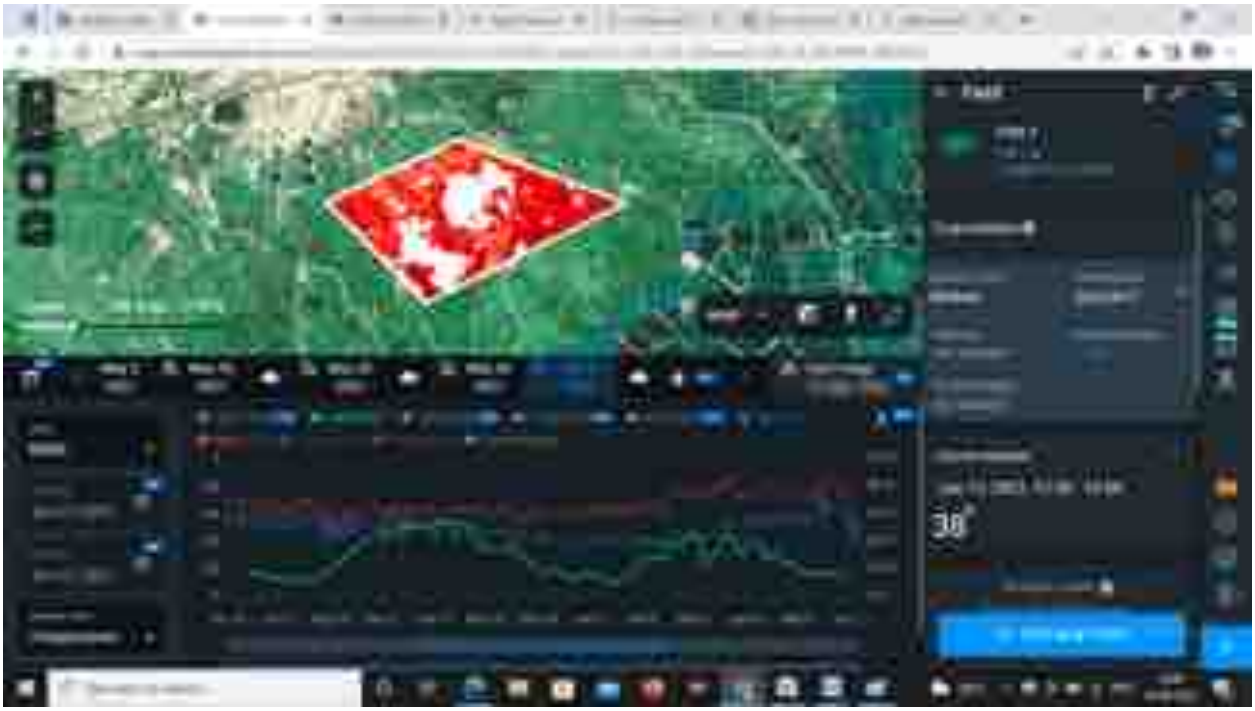


Fig 7. Shows NDRE simulation with temperature

Figure 8 shows MSAVI indices with moisture

Figure 9. shows MSAVI indices with temperature

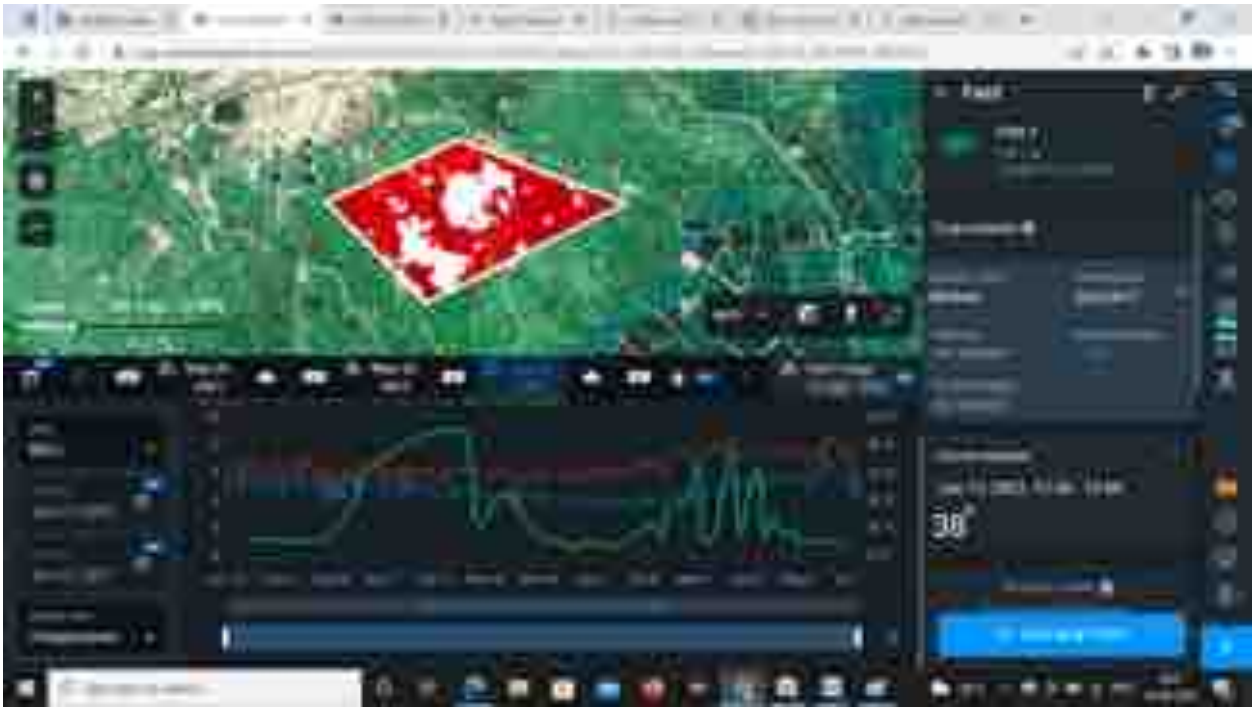


Figure 10.shows RECI indices with moisture

Figure 11 shows RECI indices with temperature

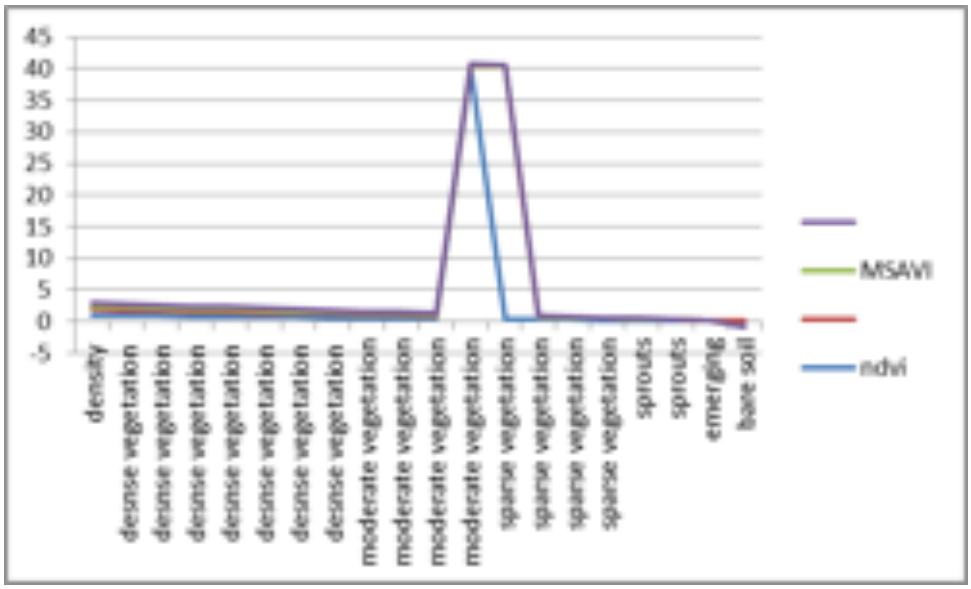


figure 12 .Comparison of NDVI and MSAVI

Discussion:

after simulation the result show s varioud indices of crop monitoring by using sensor networks fig 5 shows how much moisture in particular contour . I was selected three contour . i.e. filed 1 ,field 2 and field 3 .fig 6 shows the temperature contents of indices .satellite image shows that sensors is able to identify what is the percentage of that the crop having fig shows MSAVI indices with moisture and temperature .table 5 shows the dense vegetation by comparing indices with NDVI and MSAVI comparison have been shown fig 12.. fig 10 ,fig 11 RECI simulation result with temperature and moisture fig 7 ,fig 8 ,fig 9 shows simulation result with moisture and temperature

Conclusion

Vegetation files are not inside actual amounts they are generally used to notice vegetation elements .it is an optically based proportion of vegetation of overhang greenness ,a composite property of leaf cholorophyll,leaf region and shade engineering .L - band VOD microwave estimations can supplement the optically based greenness estimations by giving immediate and quick data plant water content and ground biomass by implication. Results demonstrating potential multisensory procedures for worldwide harvest land planning method

Conflict of Interest

There is no conflict of interest

Funding Agencies

No funding agencies

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