

CORRELATION BETWEEN PASTURES YIELD AND VEGETATIVE INDEX BY MEANS OF MULTISPECTRAL DATA

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1 Objectives

It is necessary to develop a model that gives the possibility to compute air vegetative pasture yield by means of reflected (visible - infrared) energy quantification, ground measurement.

2 Antecedents

To get agronomic parameters by means of spectral data, at distance, it is important to develop, take into account and calibrate non destructive methodologies.

In United States, green indexes were calibrated statistically on a million data obtained along their country.

In Argentina this methodology must be adapted to its respective agronomic and ecological conditions that are different from those conditions that characterize the north hemisphere.

In Argentina this techniques has been developed successfully on wheat crops, (Raed, Espoz, 1987), and on natural fields (Redondo, Raed, Conesa, Benitez, 1989), and the objective of this paper is to extend this research to other areas of the same country, with different environment conditions.

3 Materials and Methods

The reflected energy of vegetation, in the visible and near infrared range of the electromagnetic spectrum, depends of different kind of parameters and functions,

such that they are related directly with productivity characteristics.

The proposed methodology studies the relations among the green reflected energy, vegetative indexes, just to evaluate the principal parameters that define and characterize the physical pasture conditions (cover, green matter, wet matter, etc).

The reflected energy is gathered with a radiometer that has two bands in the visible range and two bands in the near infrared range, just to settle down the physical pasture conditions, with various ground measurements and afterwards been analysed at a green sample laboratory.

It has been selected sixteen test fields al Lujan National University Campus, which is located in the Pradera Pampeana region, covered with 1992, 1994 and 1995 permanent pastures, 1995 interseeded pastures, foraging pasture and grassland. Five hundred measurements have been done on these test fields in Summer, between 10.00 am. and 2.00 pm, in the same atmospheric conditions. The measurements have been taken at the same height, with about 20 centimeters field resolution.

It is hoped to determine the vegetative indexes that best spatially and spectrally fitted the actual pasture situation on the selected area.

In this way it is necessary to improve a method to analyse and evaluate a non destructive, quick, cheap, and fitted system to define pasture state, such as pasture management, grazing, desertification.

This application, on remote sensing, allows effectiveness to estimate, dinamically, the actual situation of pasture, taking into

account a fitted decision with respect to the control, care, and reasonable use of them.

This paper includes different areas that contain natural pastures in different situations, such as agriculture and cattle raising.

The training areas are chosen to take into account spectral variations on ground and the forward correlation with digital satellite data for great pasture areas.

The radiometric measurements allow correlation among reflectance answer and level of heterogeneity of each selected training area, and this event helps to understand digital satellite data of the same area.

The digital satellite data belong to visible and near infrared spectral bands, just as radiometric spectral range, to compare the difference between both kind of measurements.

It must be taken into account the different scale between radiometric measurements and digital satellite data, because radiometric measurements help understand the global situation shown by satellite image.

Besides, there is another radiometric group, with some common authors, to begin a radiometric study, at the same time, to characterize soil properties of the same area, to settle down a complete study of the same areas.

In a second stage it will be included test field pastures at North West Misiones Province, which is located in a subtropical area of Argentina.

4 Conclusion

This subject is part of a line of research just to find the correlation level between ground radiometric measurements with satellite digital data of pasture areas.

Besides it is important to take into account a good correlation between vegetative index, pasture yield and radiometric measurements on different pastures, just to avoid destructive methodologies.

5 References

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