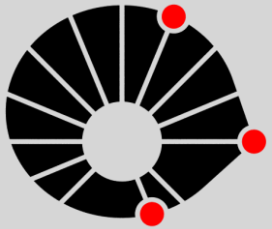
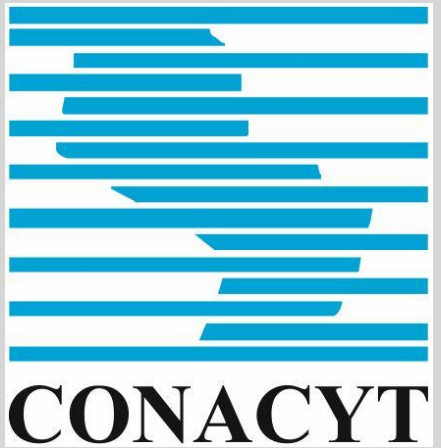
Socialización de estancia en la Universidad de Campinas

Ing. Agr. Carlos Miranda

Febrero 2017



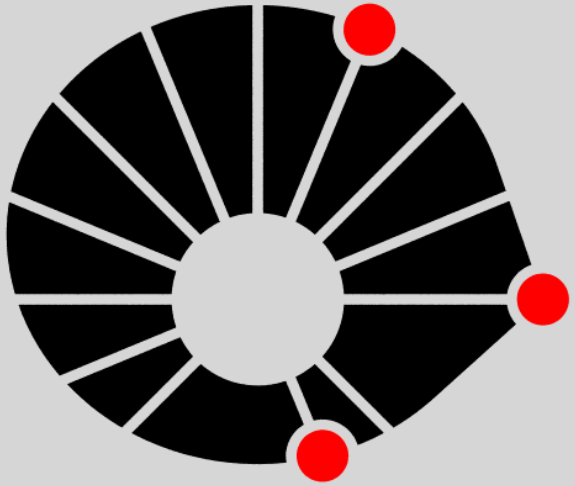


Ubicación de Campinas

Universidad Estatal de Campinas (UNICAMP)

FEAGRI

Faculdade de Engenharia Agrícola Unicamp



- 2da mejor Universidad de América Latina (ranking QS)
- 66 carreras de grado
- 153 cursos de posgrado
- 1800 docentes
- 18700 alumnos

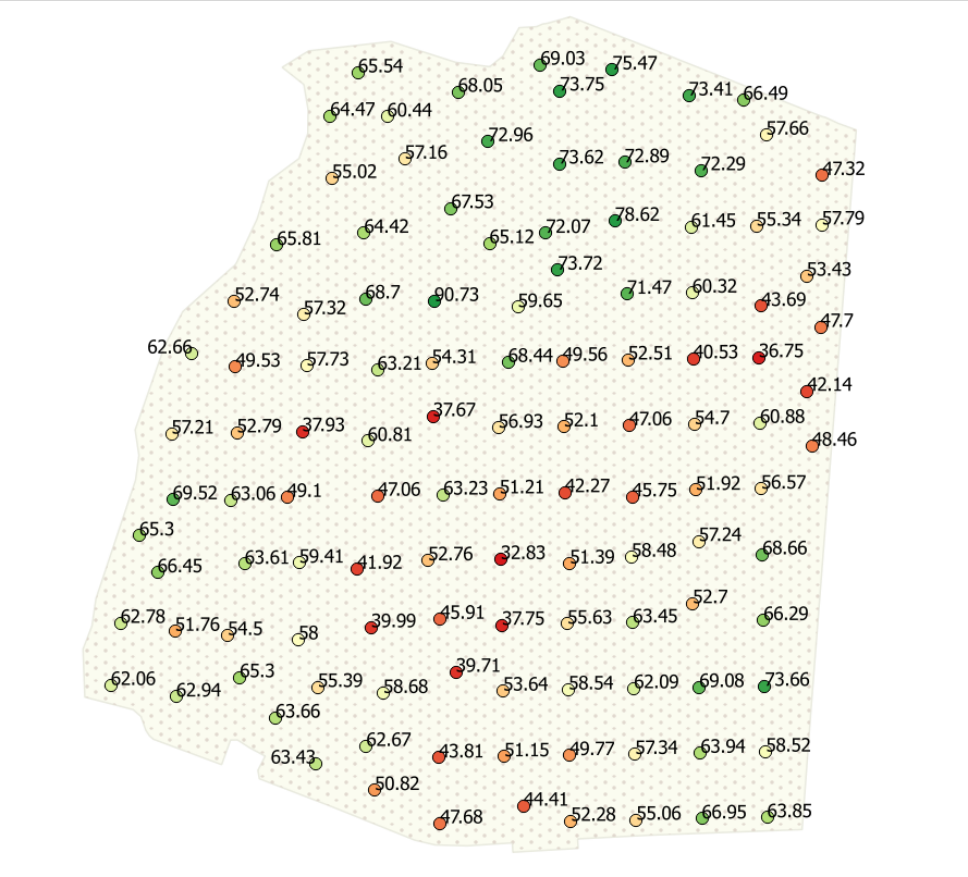
GiTAP

Actividades realizadas

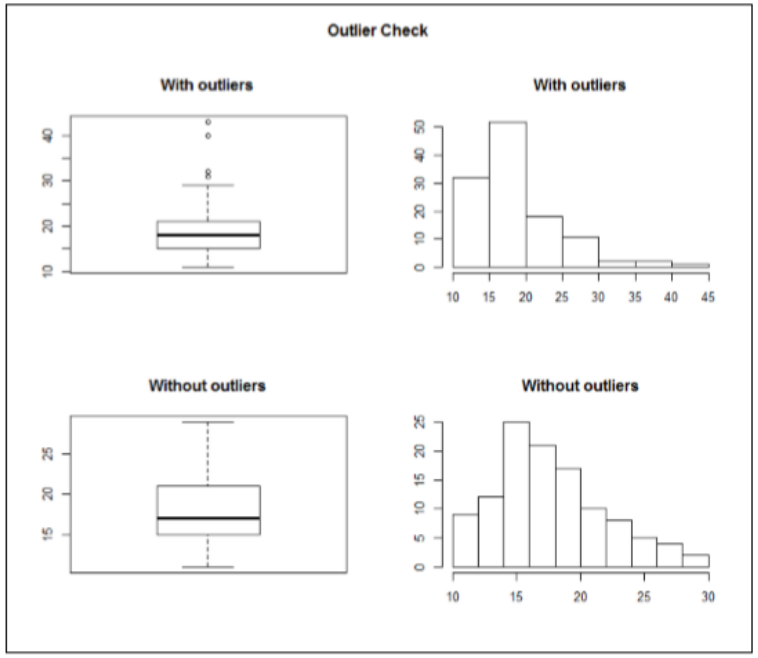
- Análisis geoestadístico de datos
- Recolección de datos biométricos de caña de azúcar
- Participación en Congreso Brasilero de Agricultura de Precisión
- Elaboración de artículo para presentación en Congreso Europeo de Agricultura de Precisión

Análisis geoestadístico de datos

- Datos obtenidos a través de muestreo sistemático mediante grilla cuadrangular
- 5 parcelas diferentes: Alcidia, Japaratuba,
- Sao Joao, Pedra seca, Santa Fe.
- Información analizada: P, K, CIC, SB.



Remoción de outliers



Outliers identified: 5

Propotion (%) of outliers: 4.2

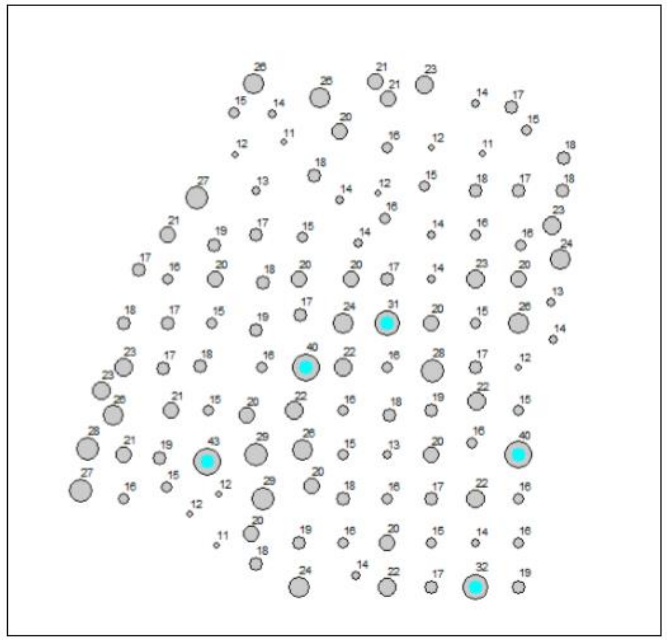
Mean of the outliers: 37.2

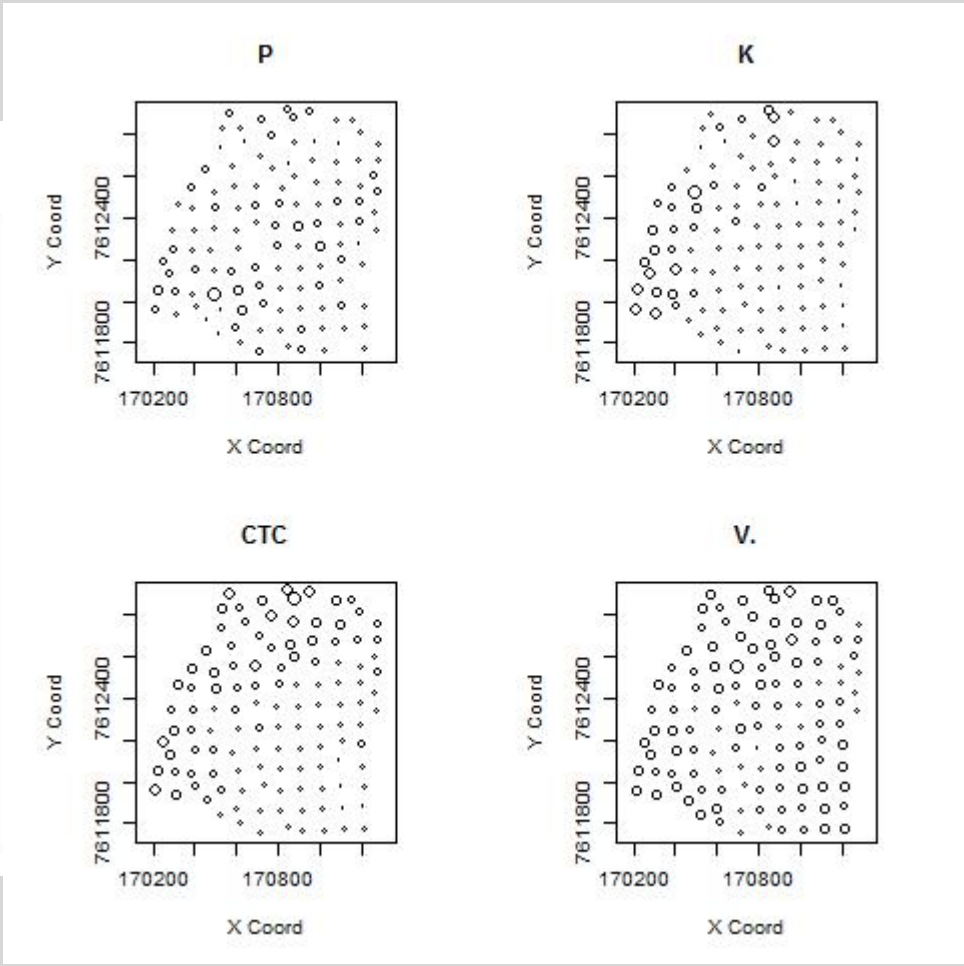
Mean without removing outliers: 19.03

Mean if we remove outliers: 18.23

Soutliers

[1] 32 43 40 40 31



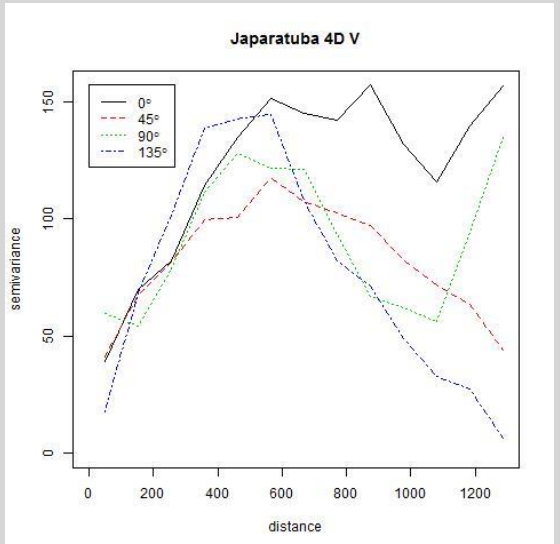


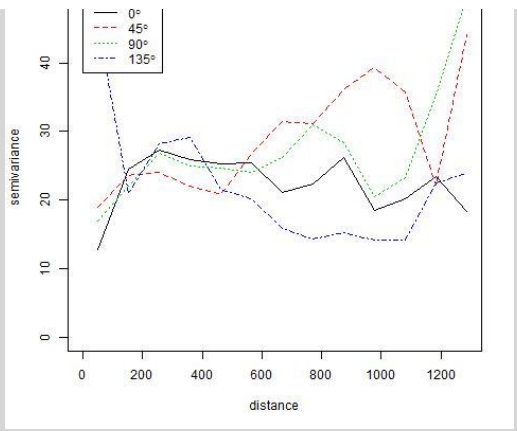
- Método de tukey (5%)
- Análisis visual de outliers identificados.
- Número de outliers <20% del total de datos

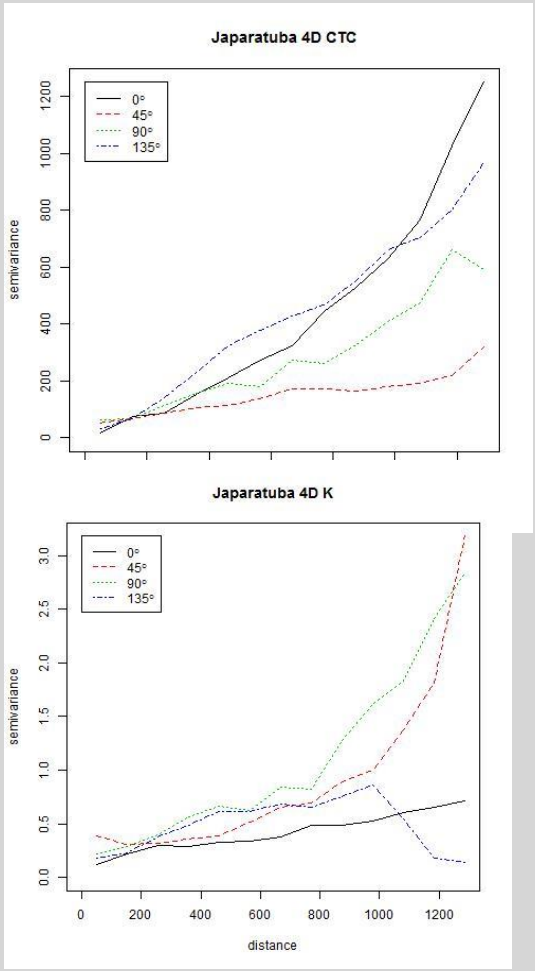
Modelado de la dependencia espacial

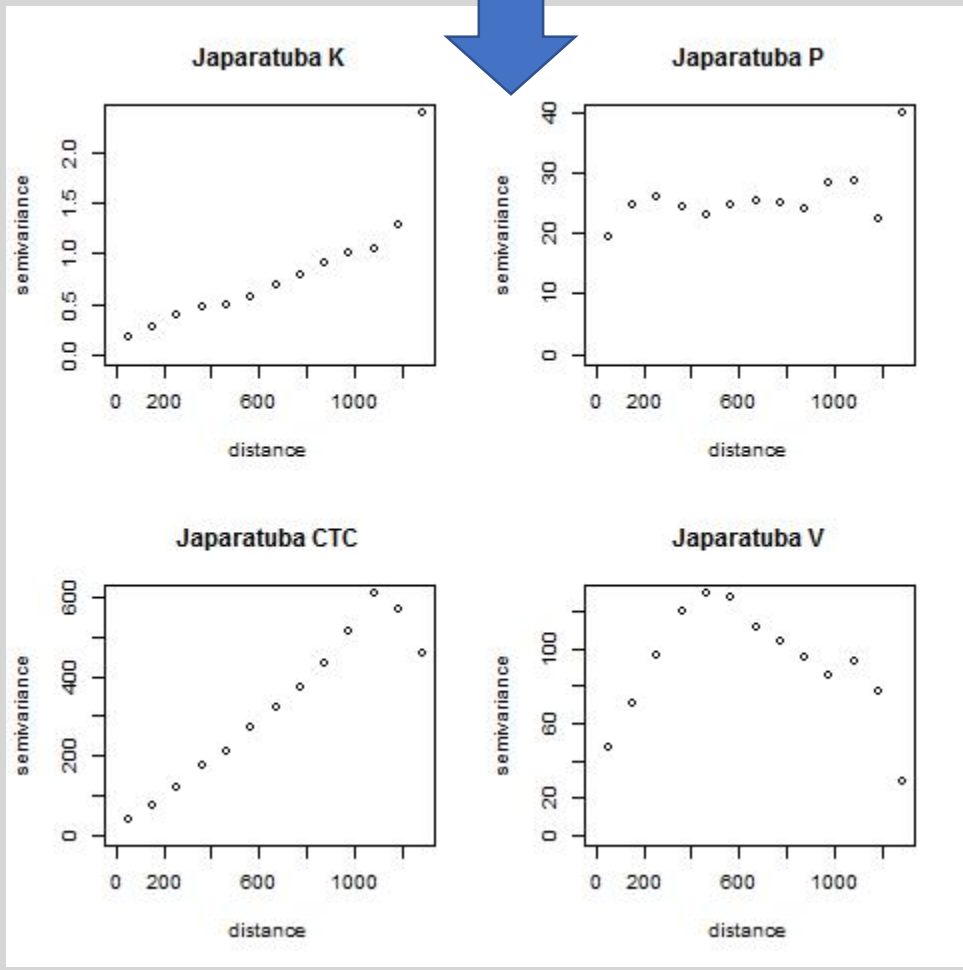
- Análisis del semivariograma experimental
- Semivariogramas direccionales

Semivariograma omnidireccional









Recolección de datos biométricos de caña de azúcar

Datos biometricos recolectados: diametro de tallo, densidad de macollos por metro, altura de planta, IAF, tenor de clorofila, NDVI, NDRE, biomasa húmeda.

Índices de vegetación

- NDVI: proporción de reflectancia del espectro infrarrojo normalizado al espectro rojo
- NDRE: proporción de reflectancia del espectro “red edge” normalizado al espectro rojo.

Participación en Congreso Brasilero de Agricultura de Precisión

- Congreso Bianual realizado por la Asociación Brasilera de Agricultura de Precisión
- Realizado en la Ciudad de Goiania
- 04 al 06 de octubre

ConBAP 2016
CONGRESSO BRASILEIRO DE AGRICULTURA DE PRECISÃO


49


ConBAP
2016
UFG


Material e métodos


ConBAP
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Elaboración de artículo para presentación en Congreso Europeo de Agricultura de Precisión

- Necesidad de cuantificar la biomasa en cana de azúcar
- Correlación de datos biometricos
- Previsión de escenarios
- Utilización de tecnología de recolección de datos en tiempo real
- Generación de modelos de predicción

- **Ubicación y diseño de parcelas**

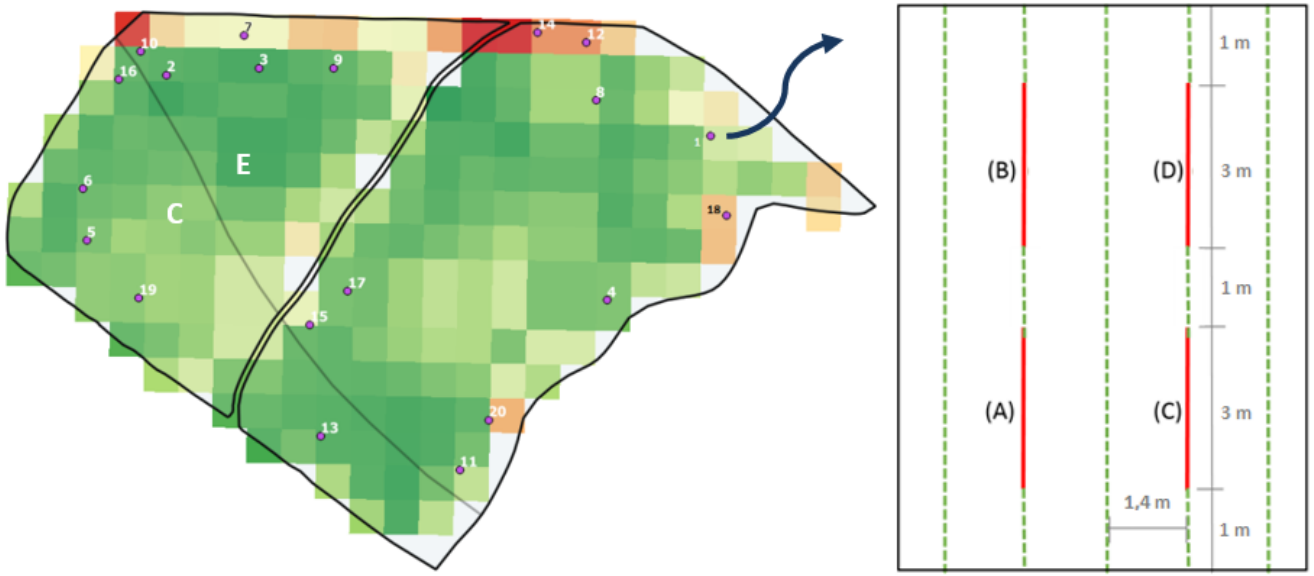


Figure 1. Farm "Boa Vista" with NDVI LandSat-8 image before previous harvest and production environments "C" and "E" divided by a line. Highlighted there is an example of plot where (A), (B), (C) and (D) correspond to different stages of evaluation. The same methodology was used for farm "Santa Luzia".

Modelos de predicción

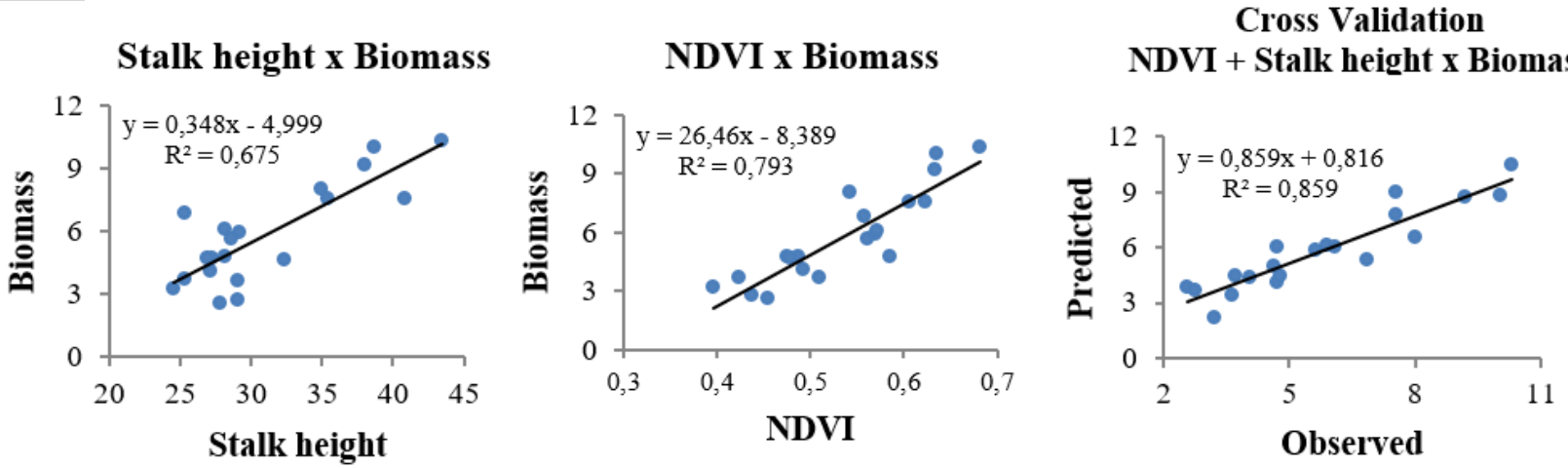
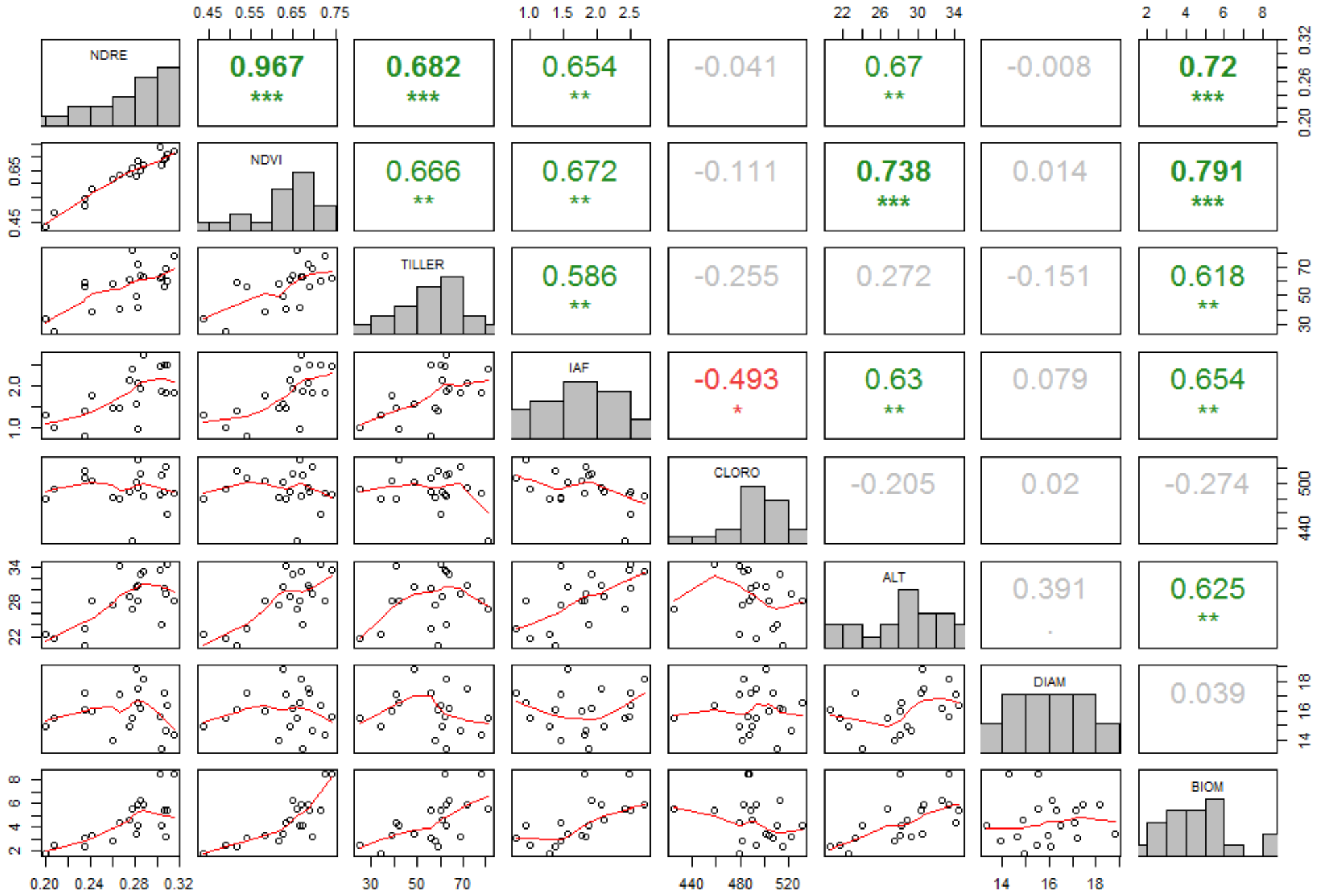


Figure 2. Regressions of stalk height and NDVI with biomass and multiple regression associating both, for "Boa Vista" on second approach.

Matriz de correlación



Early stage sugarcane biomass accumulation prediction by proximal sensing and crop parameters

M. G. da Rocha[1†], L. R. do Amaral[1] and C. F. M. Dencowski[2]

[1]School of Agricultural Engineering – University of Campinas, São Paulo, Brazil; [2]School of Agronomic Engineering – National University of the East, Minga Guazú, Paraguay

Due to the lack of reliable yield monitor for sugarcane, production factors which impact and limit stalk yield within fields are not well-known. Thus, this study aims to evaluate if canopy sensor technology is able to identify sugarcane biomass variability and if obtaining other agronomic variable data can assist on biomass quantification. For that, forty targeted plots were allocated within two sugarcane-producing fields and data consisted on manual biometric evaluation, aboveground biomass measurement and canopy reflectance. As an ongoing experiment, only the first two evaluations were addressed (~0.3 and 0.5 m stalk height). On the earliest stage, canopy sensor readings were correlated to sugarcane biomass and their sensitivity to biomass variability was higher. Further, data collected on the first evaluation was efficient in predicting biomass amount after 30 days. On the second, canopy sensor readings effectiveness to predict biomass was reduced. These findings suggest that crop canopy reflectance sensing is a useful approach to investigate sugarcane biomass spatial-variability within fields on early stages.

Keywords: NDVI, NDRE, canopy sensor, reflectance, agronomic variables

Conclusions

Crop canopy reflectance sensing is a useful approach to investigate sugarcane biomass spatial-variability within fields on early stages. Also, the relationship between crop variable, proximal sensing data and sugarcane biomass can be different depending on the crop variety and field characteristics. Combining approaches of proximal sensing can be an alternative to obtain high-accurate biomass prediction on early stages in order to improve agronomic investigations within sugarcane fields and variable-rate applications.

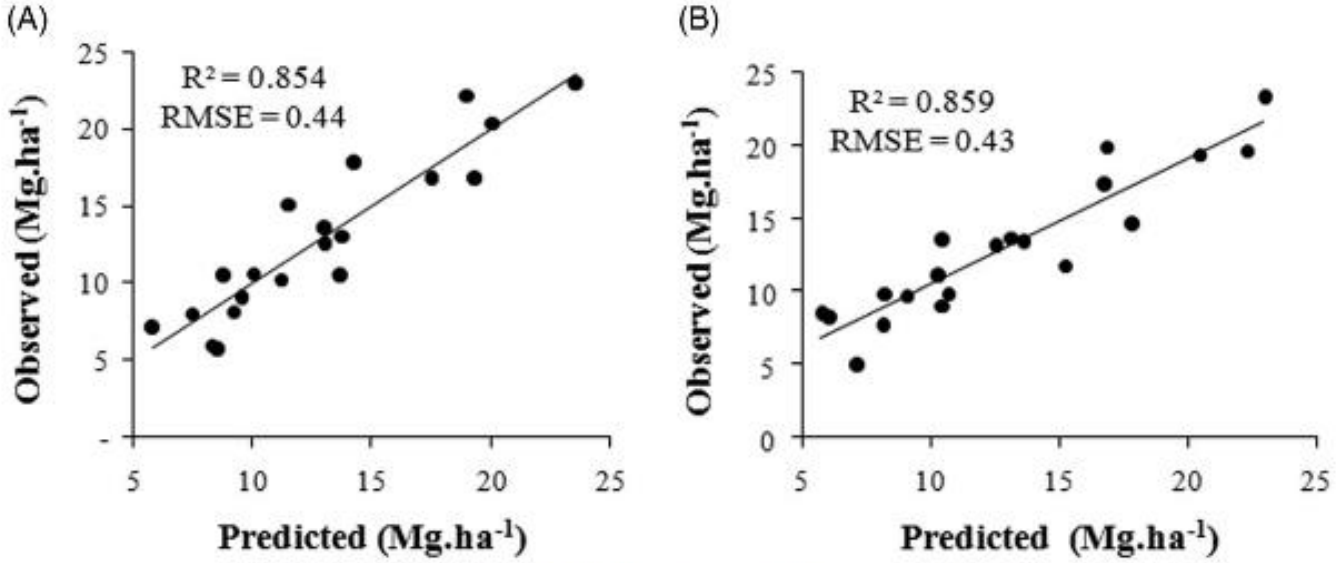


Figure 2 Biomass prediction using measured stalk height data and NDRE (A) and NDVI (B), at "Boa Vista" using prediction approach (data collected on first evaluation predicting the biomass measured on the second evaluation).

Agradecimientos