EUBCE
29th European Biomass Conference & Exhibition
26 - 29 April | ONLINE

Di3A
Dipartimento di Agricoltura Alimentazione e Ambiente

THE RESPONSE OF LIGNOCELLULOSIC PERENNIAL GRASSES TO DIFFERENT SOIL WATER AVAILABILITY

Sebastiano Andrea Corinzia[1], Barbara Rachele Ciaramella[1], Alessandra Piccitto[1], Giorgio Testa[1], Cristina Patanè[2], Salvatore Luciano Cosentino[1], Danilo Scordia[1]*

[1]Dipartmento di Agricoltura, Alimentazione e Ambiente – Di3A, University of Catania, via Valdisavoia 5, 95123 Catania, Italy.

[2]Consiglio Nazionale delle Ricerche, Istituto per la Bioeconomia (CNR-IBE), Sede secondaria di Catania, via Gaifami

*Corresponding author: Danilo Scordia (dscordia@unict.it)

Introduction

The field trial aims to assess the response of diverse lignocellulosic perennial grasses under three different irrigation regimes in the second year after plant establishment. Plant stem density, stem height, stem weight and leaf area index were evaluated during the growing season with a monthly frequency.

Materials and Methods

Six genotypes were evaluated in a split-plot experimental design with nine replications: two *Arundo donax* L. ecotypes, named ARCT and ARMO, the commercial *Miscanthus* x *giganteus* (Greef et Deuter) named MxG, two seed-based *Miscanthus* hybrids obtained from the breeding program led by the Institute of Biological, Environmental and Rural Sciences of Aberystwyth University (UK) and Terravesta Ltd (UK), named GNT9 and GNT10, and one ecotype of *Saccharum spontaneum*, named SAC.

The main factor assigned to the plots is the irrigation factor, with 3 levels: 100%, 50% and 0% of maximum crop evapotranspiration (ETm) restoration during the summer months (June-August).

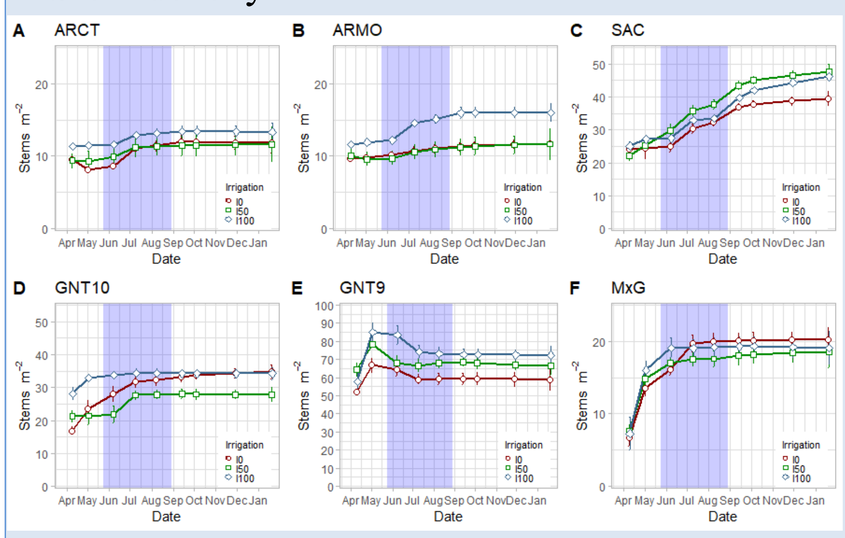
Field measurements of stem density have been measured monthly from shoot emission at the beginning of spring to leaves senescence in autumn, counting the number of stems within the inner 4 m^2 subplot.

Sampled stems have been measured for stem height (m), green leaf area per stem (cm^2), fresh and dry stem weight (g)

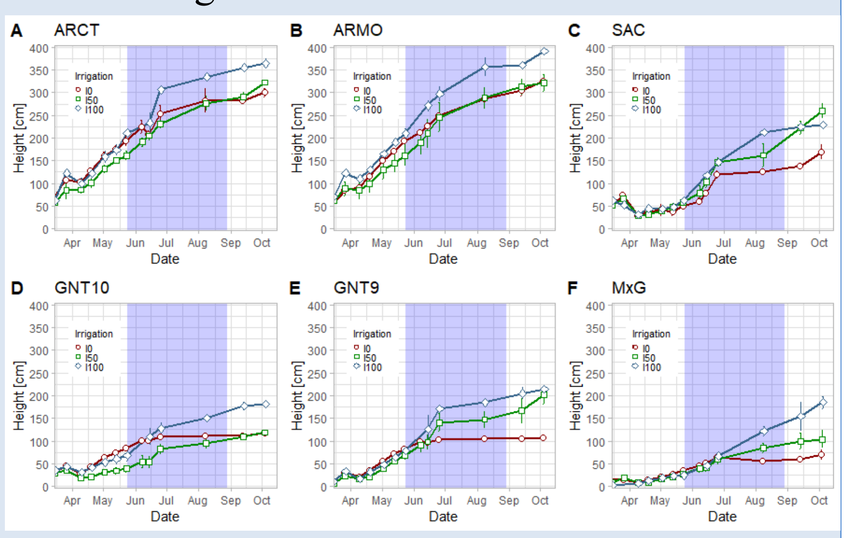
Leaf area index has been calculated by multiplying stem density and leaf area per stem.

Results

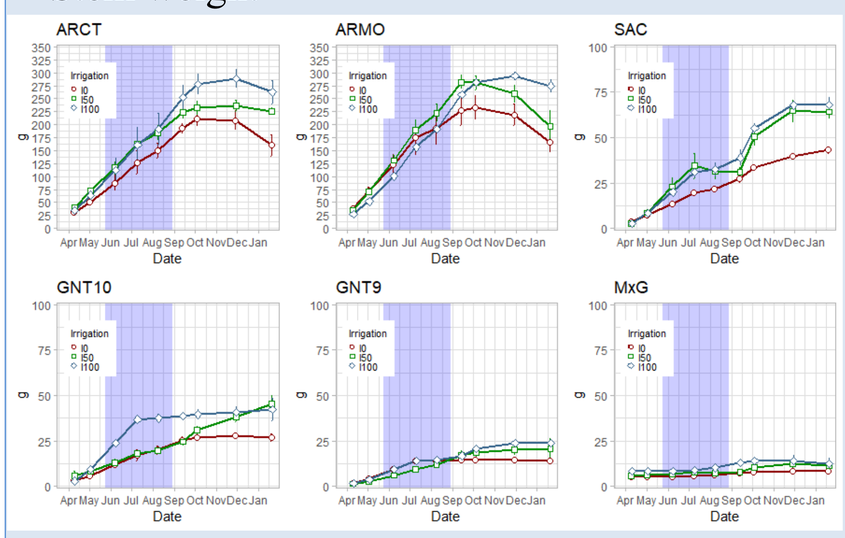
Stem density



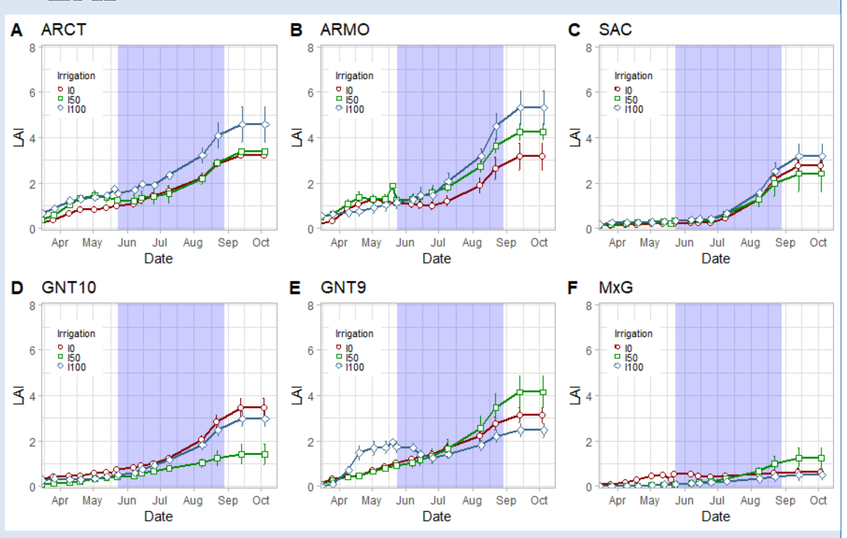
Stem height



Stem weight



LAI



Conclusions

Stem density, stem height and stem weight accounts for the greatest part of the biomass yield. Lowest stem density were observed for *A. donax* genotypes and the highest for the *Miscanthus* seed-based hybrids. Stem density increases with the higher irrigation levels.

Stem height and weight are inversely correlated to stem density. *A. donax* genotypes had higher stem height and weight than the other genotypes. Irrigation has a significant positive effect on both measures. Stem height and weight are inversely correlated to stem density. *A. donax* genotypes had higher stem height and weight than the other genotypes. Irrigation has a significant positive effect on both measures.

Leaf area index varied among genotypes, and irrigation increased this trait.