BIOKENAF

QLK5-CT-2002-01729

Biomass Production Chain and Growth Simulation Model for Kenaf

INSTITUTO NACIONAL DE INVESTIGACIÓN Y TECNOLOGÍA AGRARIA Y ALIMENTARIA (INIA)
DPTO. MEDIO AMBIENTE
ALCALA DE HENARES, MADRID, SPAIN

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INIA
Dpto. Medio Ambiente
Alcalá de Henares (Madrid)

Task 2.3: Effect of irrigation and nitrogen fertilization on biomass yields

Task 2.2: Effect of different sowing dates and plant population on biomass yields

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Junta de Extremadura
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Task 2.3: Effect of irrigation and nitrogen fertilization on biomass yields

Results of three years

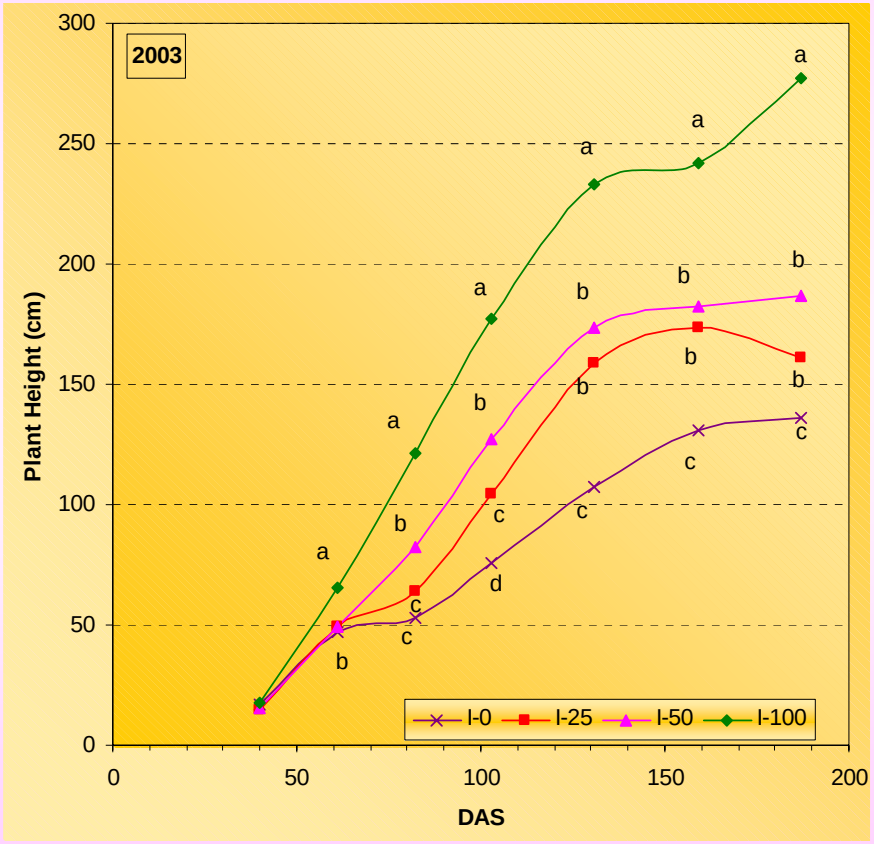
Field experiments in Alcalá de Henares, Madrid, Spain

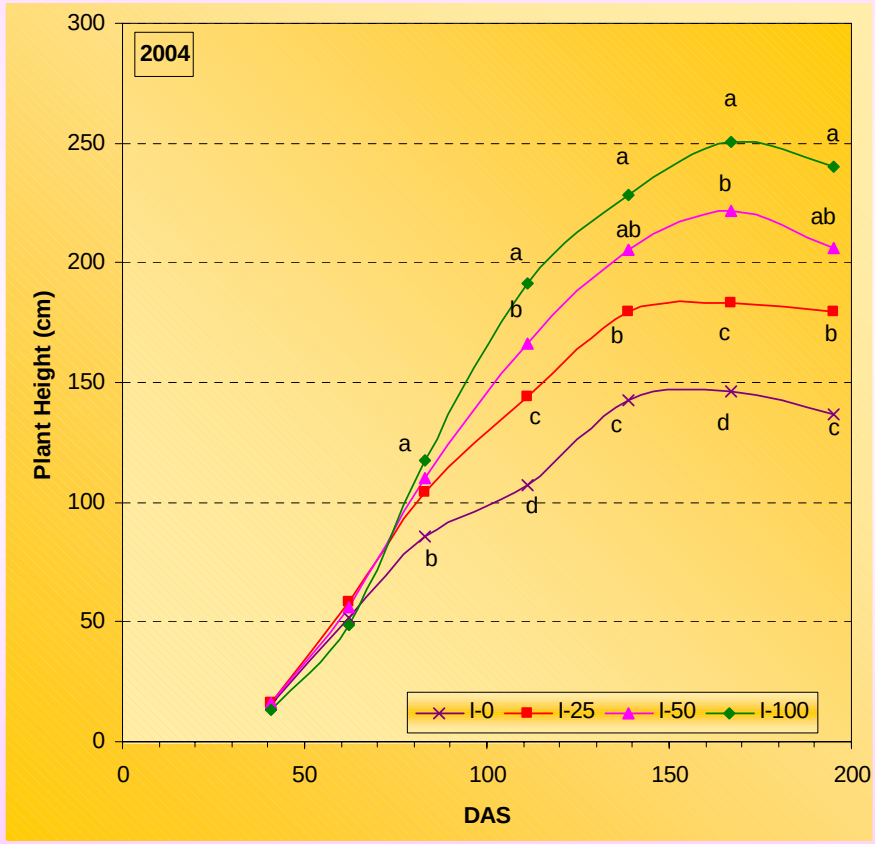
- 4 irrigation levels X 3 nitrogen fertilization X 3 replicates

	2003	2004	2005
Sowing Date	28/05/2003	01/06/2004	11/05/2005
Kenaf variety	Tainung 2		
Plant density	200000 plants/ha		
Fertilization levels	N-0: 0 kg N/ha N-75: 75 kg N/ha N-100: 100 kg N/ha	N-0: 0 kg N/ha N-75: 75 kg N/ha N-150: 150 kg N/ha	
Irrigation levels	I-0: 0% of PET I-25: 25% of PET I-50: 50% of PET I-100: 100% of PET		

Previous results

Effect of irrigation (I_0, without irrigation; I_{25}, 25 % PET; I_{50}, 50 % PET; I_{100}, 100% PET) on the plant height throughout the growing period of kenaf in 2003 and 2004 in Alcalá de Henares, Madrid, Spain. DAS: days after sowing.,

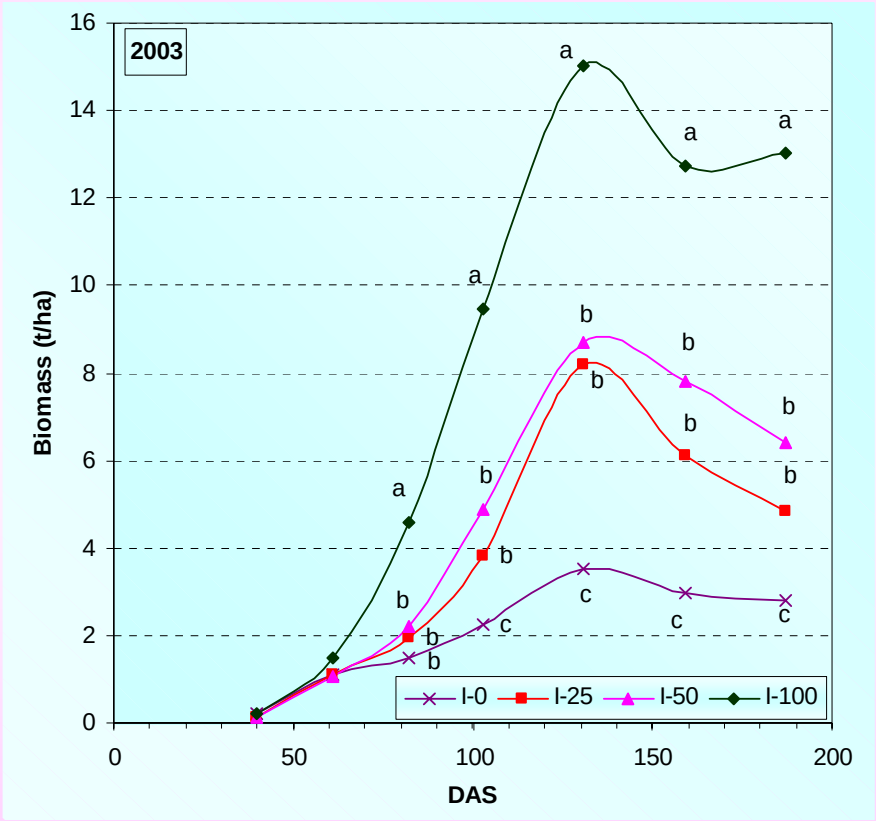


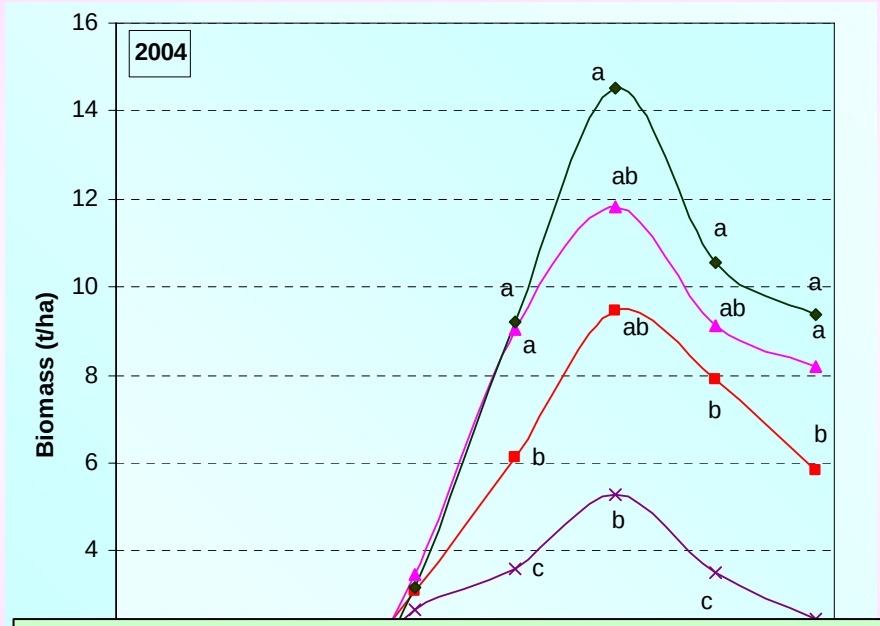


Similar growth in 2003 and 2004

Previous results

Effect of irrigation (I_0, without irrigation; I_{25}, 25 % PET; I_{50}, 50 % PET; I_{100}, 100% PET) on the total dry biomass yield throughout the growing period of kenaf in 2003 and 2004 in Alcalá de Henares, Madrid, Spain. DAS: days after sowing.

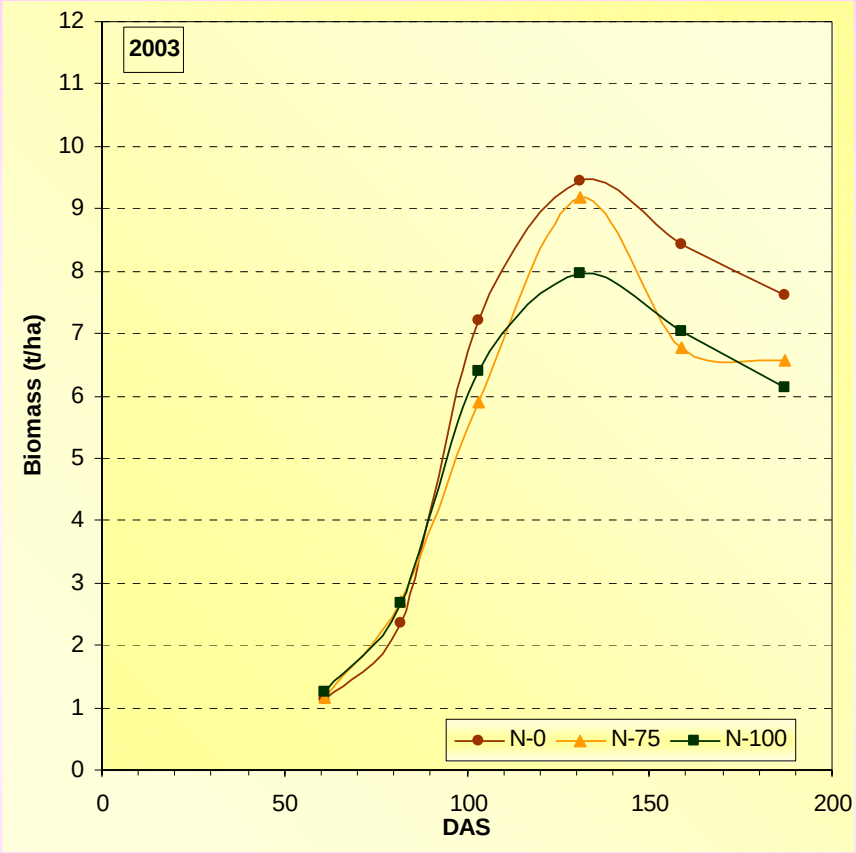


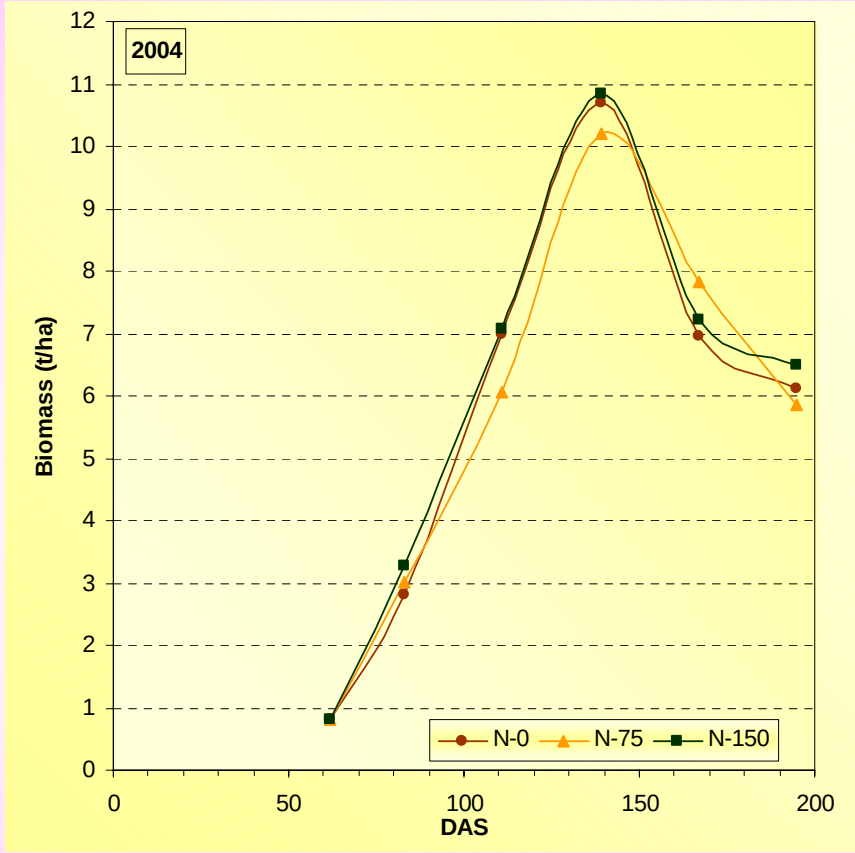


- Kenaf dry yields of 15 t/ha in total biomass and 10 t/ha in stem biomass may be obtainable
- The maximum kenaf yield were obtained at the end of october (140-150 days after sowing).

Similar biomass production in 2003 and 2004

Previous results

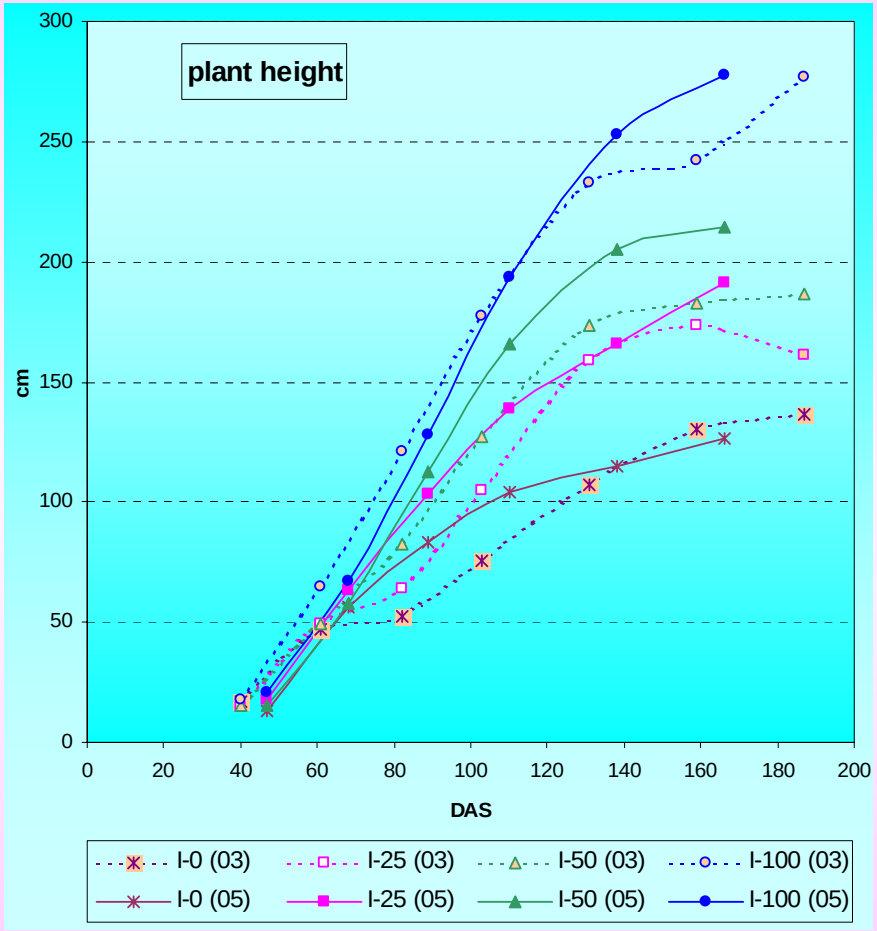




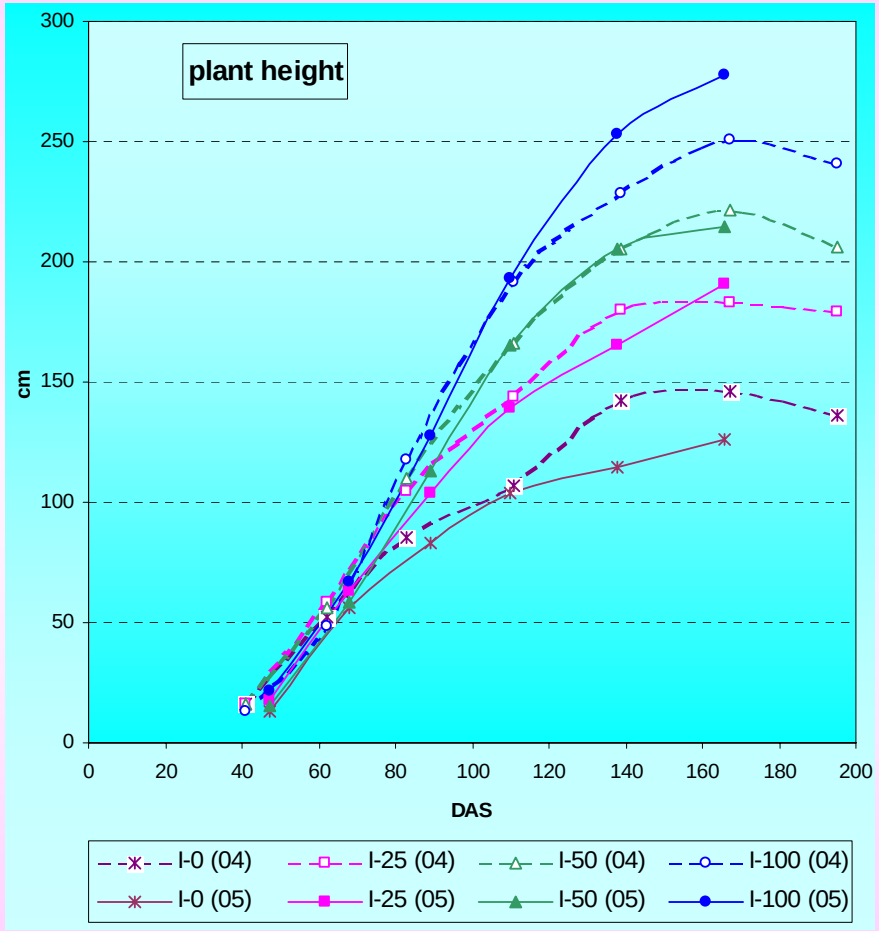
Nitrogen fertilization was not significant effect under any treatments on kenaf plant growth and plant yield.

Effect of irrigation on plant growth and biomass yields (years comparison)

2003 vs 2005



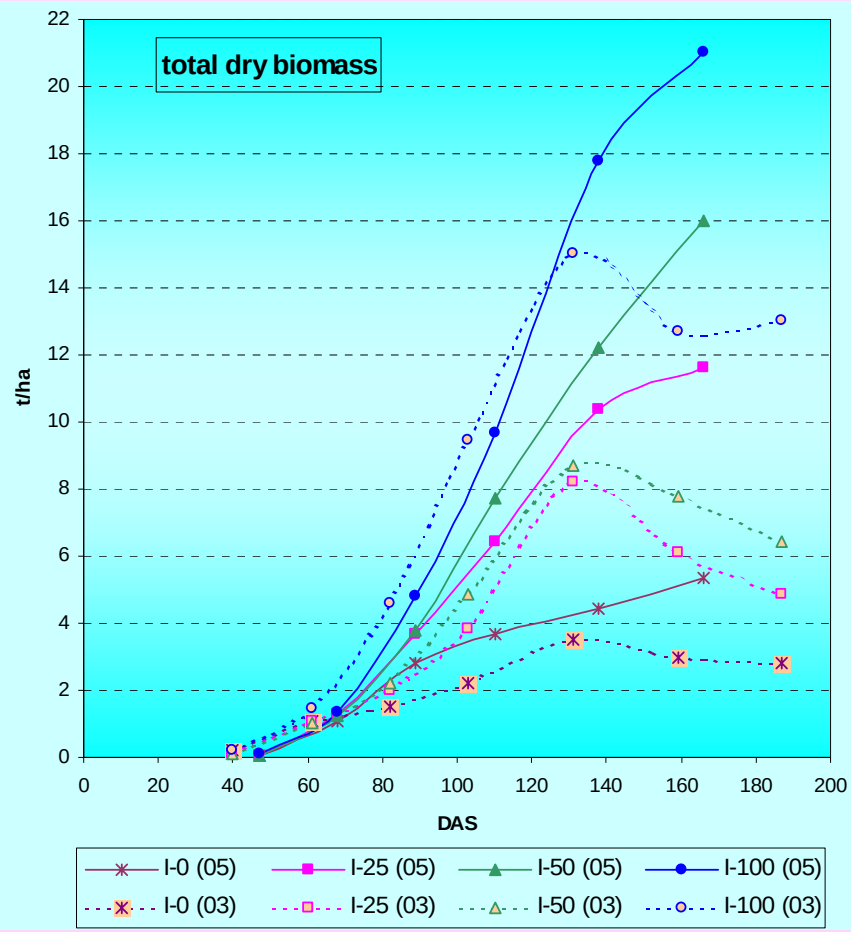
2004 vs 2005



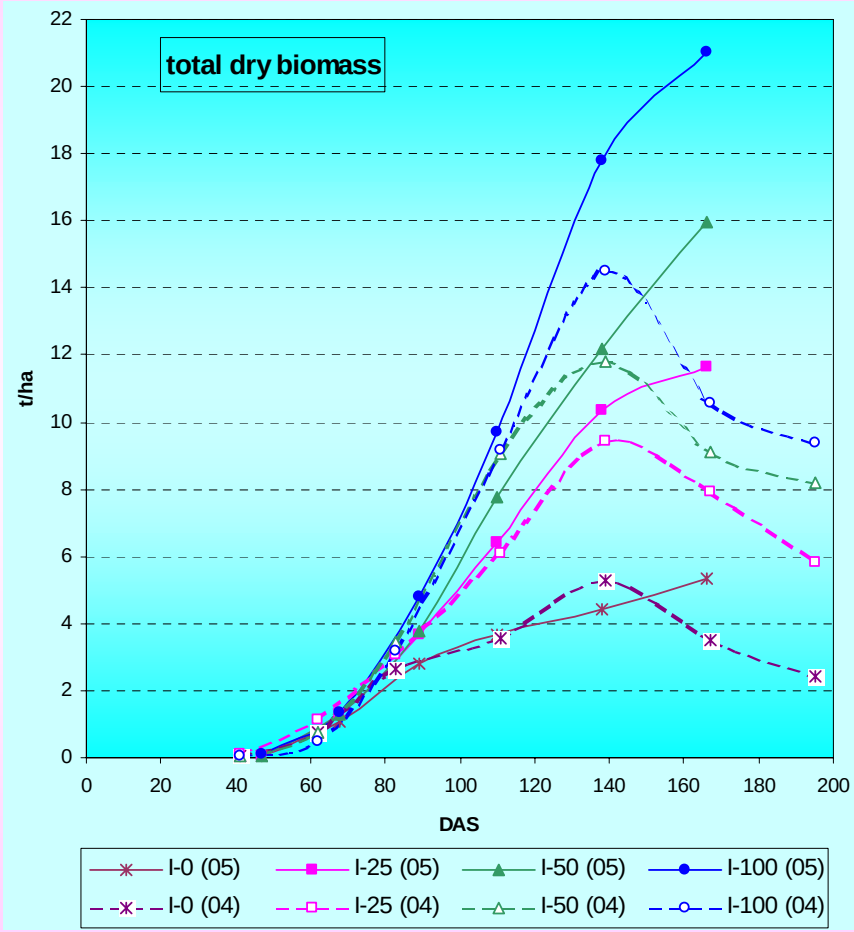
Higher growth in 2005

Effect of irrigation on plant growth and biomass yields (years comparison)

2003 vs 2005



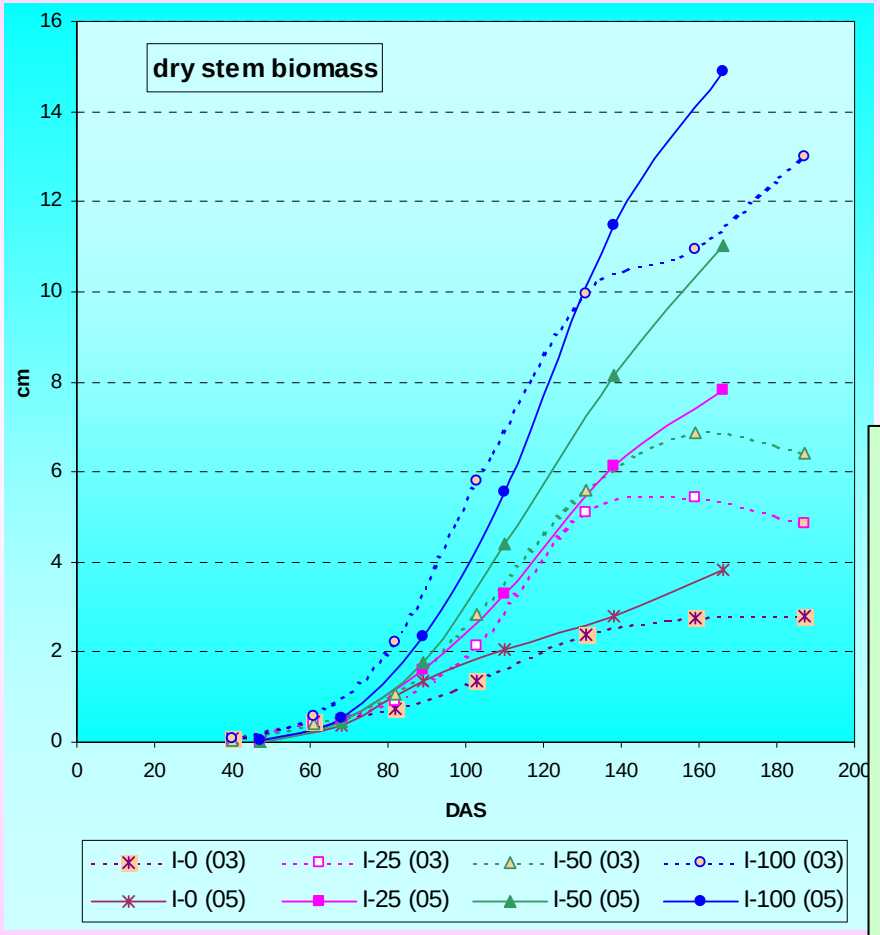
2004 vs 2005



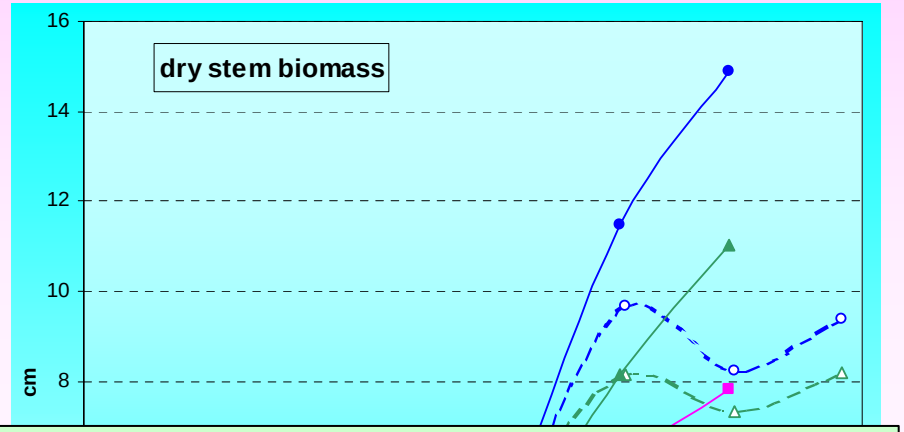
Higher biomass production in 2005

Effect of irrigation on plant growth and biomass yields (years comparison)

2003 vs 2005

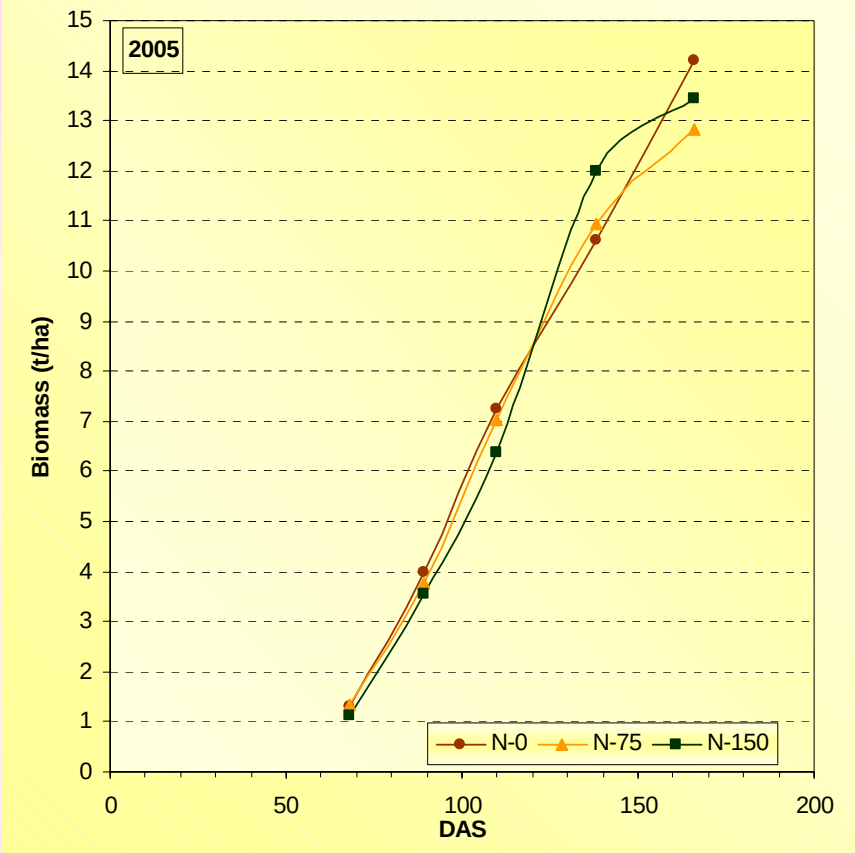


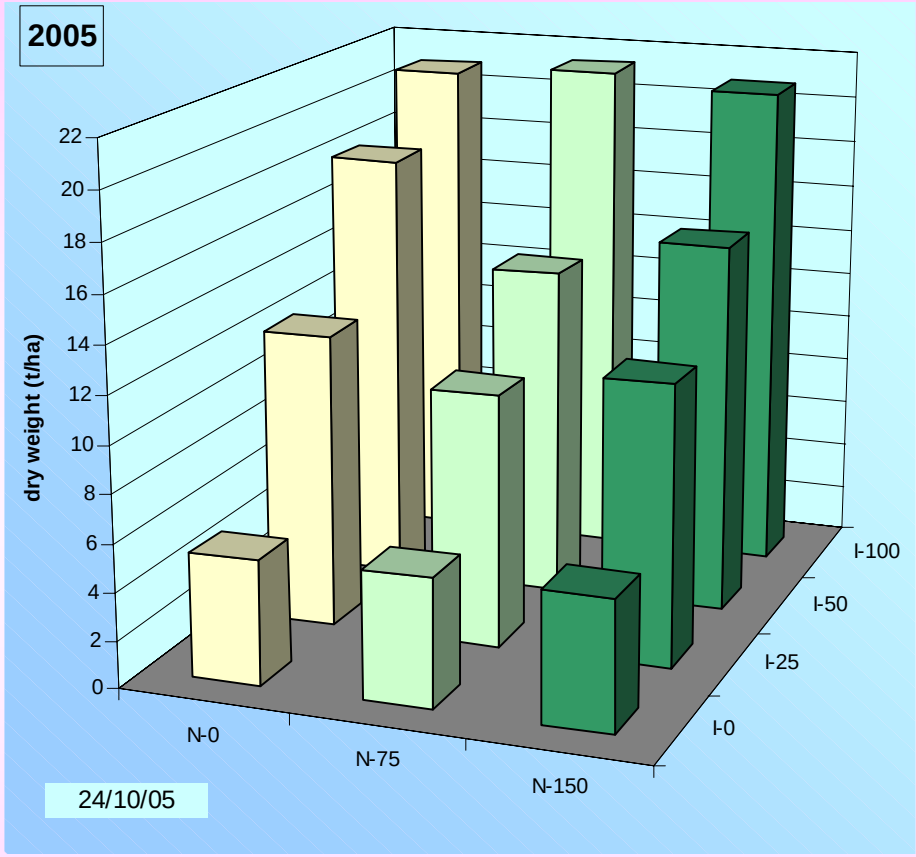
2004 vs 2005



- Kenaf dry yields of 21 t/ha in total biomass and 15 t/ha in stem biomass may be obtainable in good conditions (the growth period of kenaf was higher in 2005 than 2003 and 2004)
- Also, the maximum kenaf yield in 2005 were obtained at the end of october (170 days after sowing, the sowing time in 2005 was 3 weeks before that in 2003 or 2004).

Higher stem biomass production in 2005





Also, Nitrogen fertilization was not effect under any treatments on kenaf biomass production in 2005.

Conclusions

- In our climatic and crop rotation conditions it is not necessary the application of nitrogen fertilization.
- Kenaf dry yields of 15 t/ha in total biomass and 10 t/ha in stem biomass may be obtainable under normal conditions in central plateau of Spain, but in optimal conditions 21 t/ha in total biomass and 15 t/ha in stem biomass may be obtainable
- The maximum kenaf yield were obtained at the end of october (140-150 days after sowing in normal conditions and 170 DAS in optimal conditions).
- In the central region of Spain, the irrigation practices should be performed at 100 % PET.

Other measurements

-Leaf area meter

-SPAD

-Photosynthesis

-Chlorophyll Fluorescence

-Soil analysis

-Plant analysis (N, P, K)

This data are in process of elaboration with what they could not have included in this presentation.