WP2
Adaptability and Productivity Field Trials

Partner (7)
Faculdade de Ciências e Tecnologia
Universidade Nova de Lisboa, Portugal

Scientific team:

Profª Ana Luisa Fernando
Profª Benilde Mendes
Drª Maria Paula Duarte
Eng. João Morais
Prof. Santos Oliveira
Engª Ana Catroga
Drª Gorete Serras
Dr Nuno Lobato

Experimental fields

Located in Monte de Caparica, in the Peninsula of Setúbal,
near the University - near Lisbon, in the south border of river Tejo

Fields

Latitude: 38º 40´ N
Longitude: 9º W
Altitude: 50 m

Urban area near the Atlantic coast and the estuarine zone

Task 2.2

– Effect of different sowing dates and plant populations

on biomass yields

Major conclusions from 2003-2006

sowing dates x 2 varieties x 2 plant densities x 3 replicates

S_1: 26/6/2003
S_2: 11/7/2003
S_3: 12/7/2004
S_4: 02/8/2004
S_5: 04/5/2005
S_6: 15/6/2005

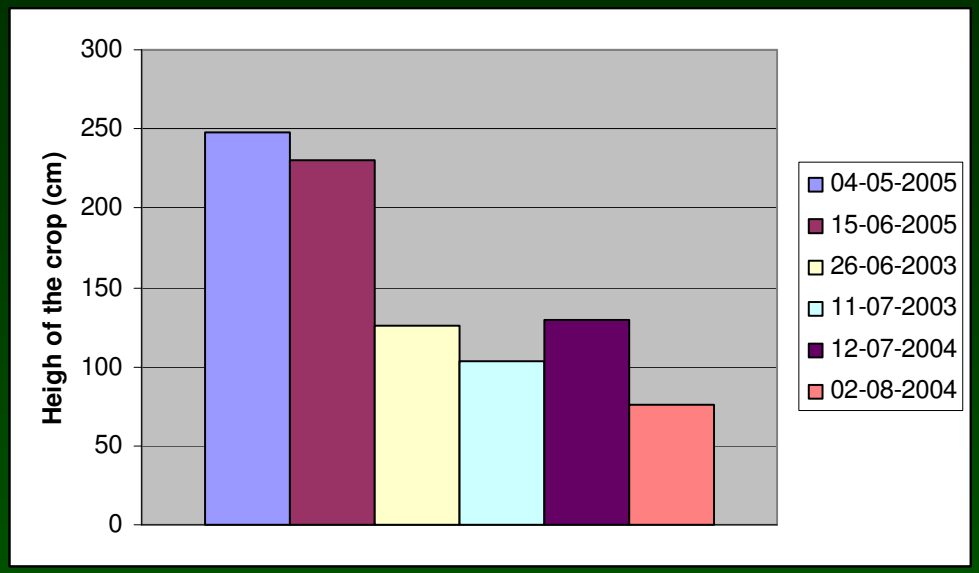
V_1: Tainung 2
V_2: Everglades 41

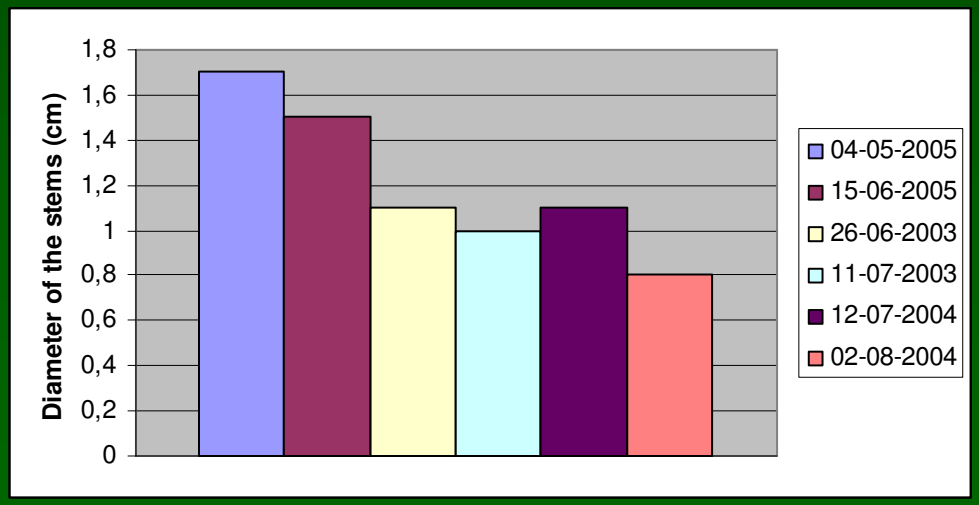
D_1: 20 plants/m^2
D_2: 40 plants/m^2

Each field: 8 x 4 m^2

75 kg N/ha
120 kg K_2O/ha
60 kg P_2O_5/ha

Sowing dates

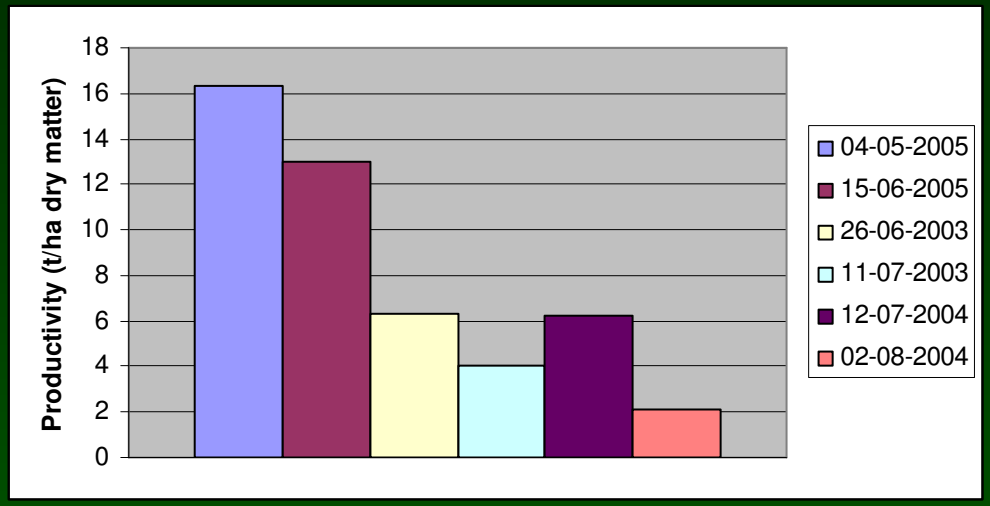


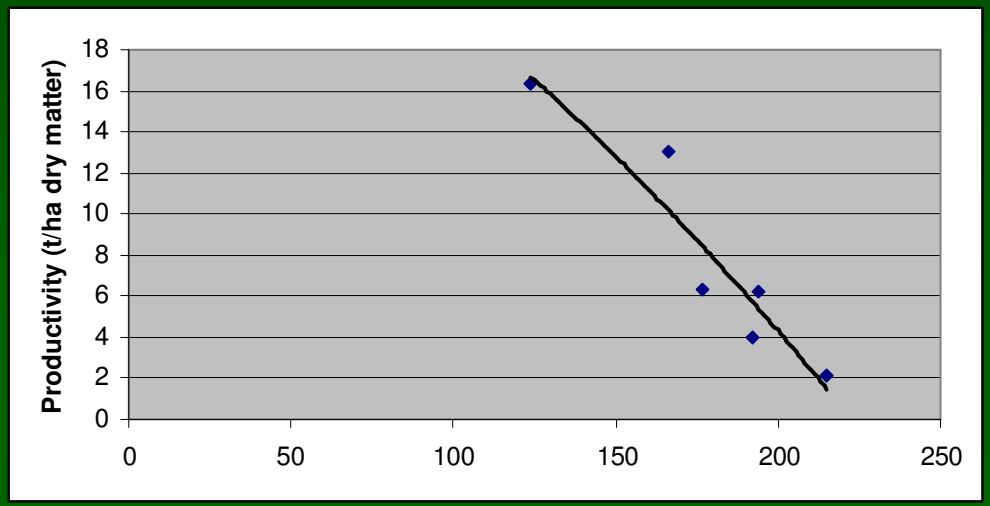


Best sowing date:

Beggining of May

Sowing dates





Best sowing date:

Beggining of May

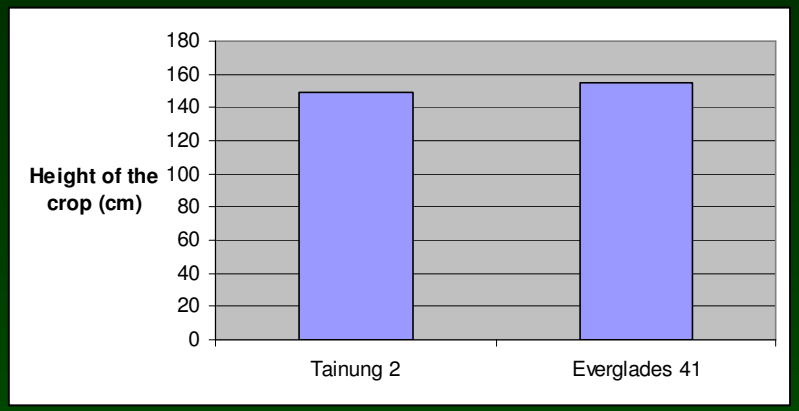
Productivity vs sowing date:

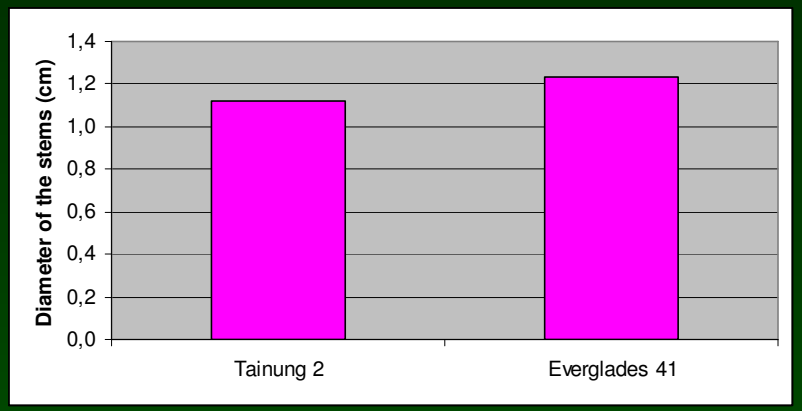
After 15th June productivities could be lower than 10t/ha

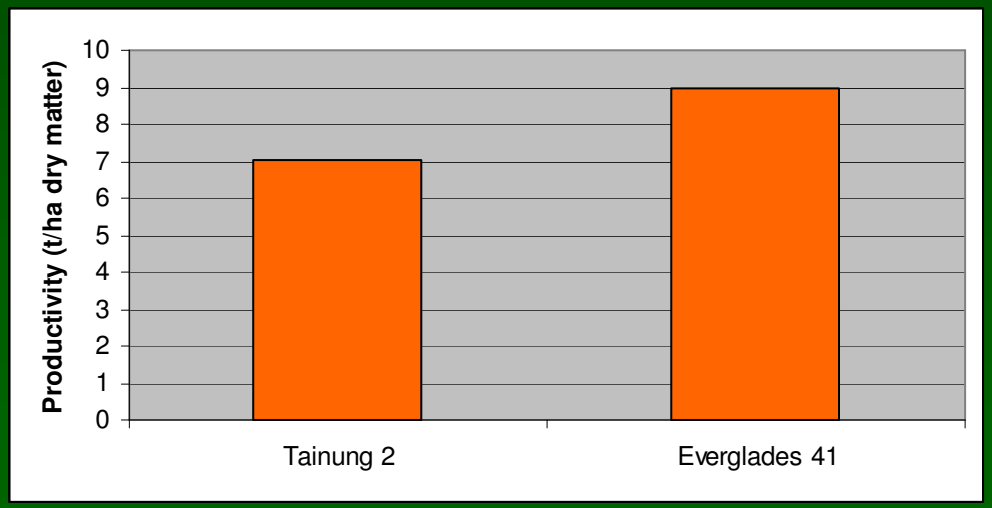
Is this profitable?

Question: What about sowing on the 15th April?

Varieties



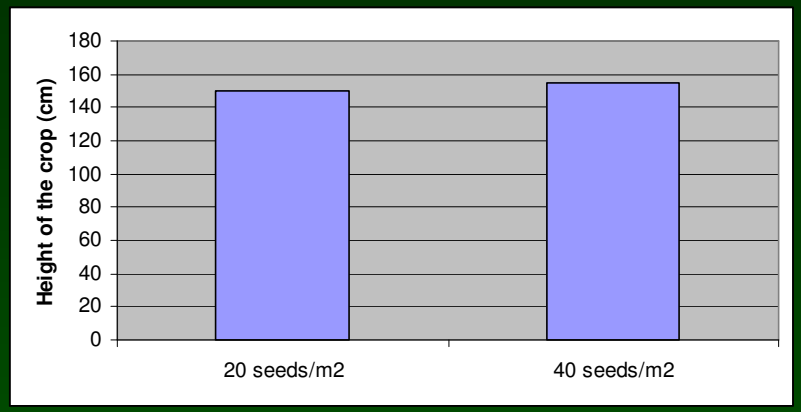




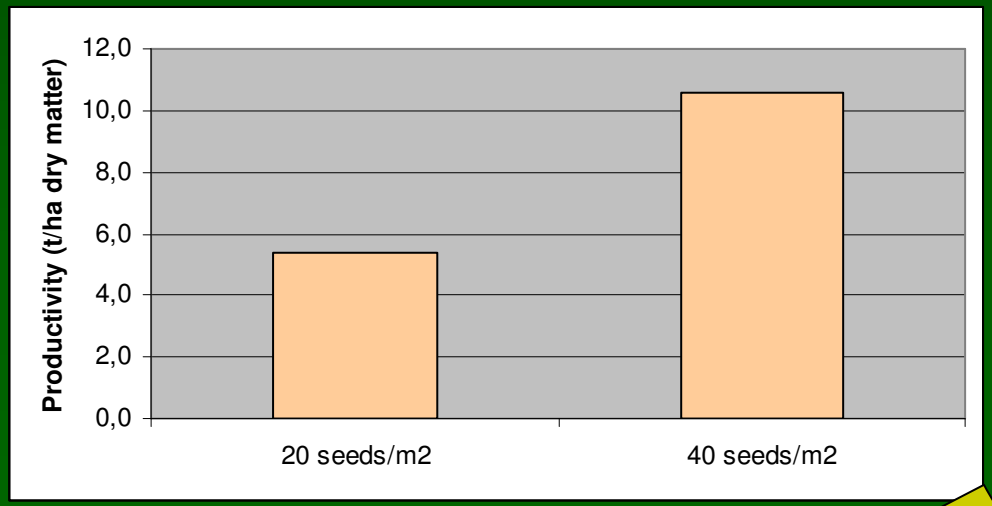
Everglades 41 presented always best results

Althought differences were never statistically significative

Plant populations

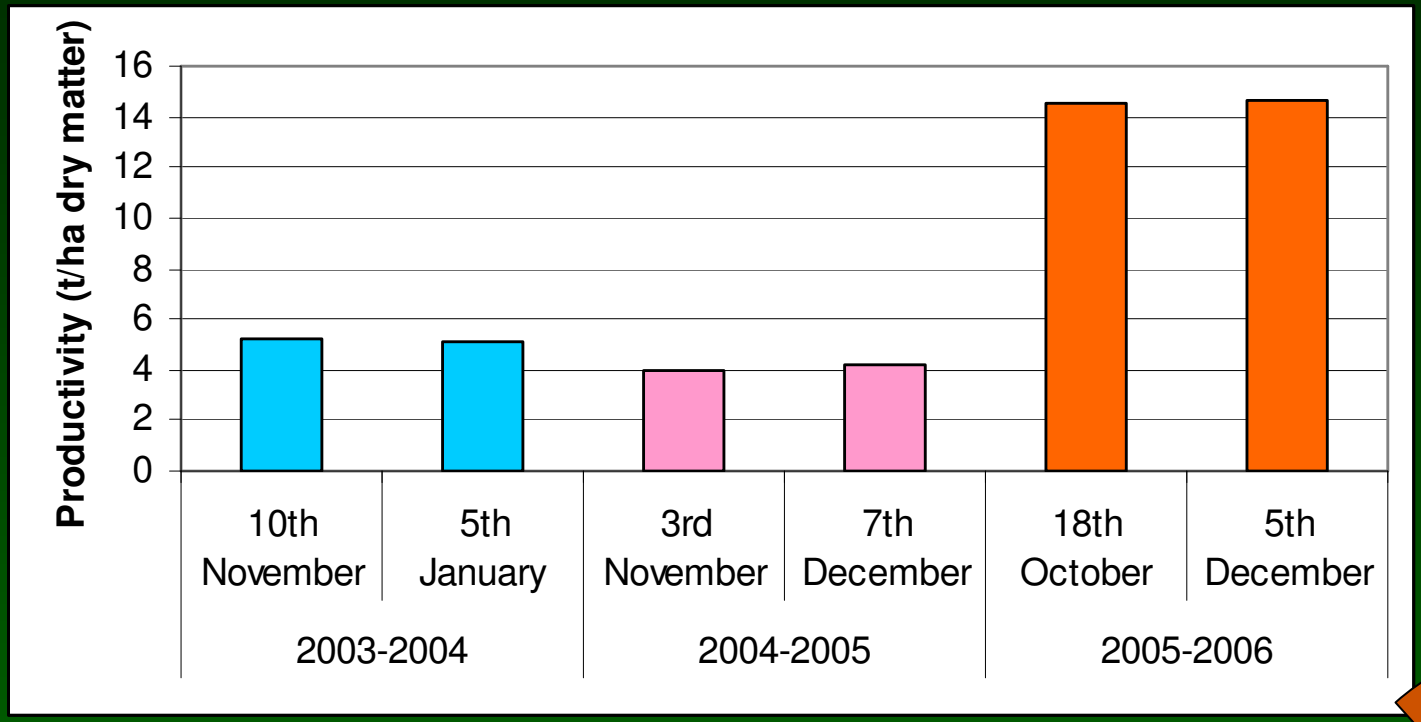


No significative differences



But fields with 40 seeds/m2 more productive than with 20 seeds/m2

Harvest dates



No significative differences, between October and January harvests (in terms of productivity)

Are there differences in quality? October harvest is better?

Task 2.3

– Effect of irrigation and nitrogen fertilization

on biomass yields

Major conclusions from 2003-2006

And results from 2007

4 irrigation levels x 3 nitrogen fertilization x 3 replicates

I_1: 0% PET
I_2: 25% PET
I_3: 50% PET
I_4: 100% PET

N_1: 0 kg N/ha
N_2: 75 kg N/ha
N_3: 150 kg N/ha

Varieties:
Tainung 2 (2003-2005)
Everglades 41 (2006)

Sowing:
04/07/2003
19/07/2004
24/05/2005
04/5/2006

20 plants/m^2

Each field: 8 x 5 m^2
120 kg K_2O/ha
60 kg P_2O_5/ha

At early stages of growth, all the fields were fully irrigated in order to compensate the water deficit of the soil (plants with 20 cm height)

41 days after sowing (2003)
40 days after sowing (2004)
40 days after sowing (2005)
52 days after sowing (2006)

2006

✓ **No significant difficulties were observed during this 4th period of work.**

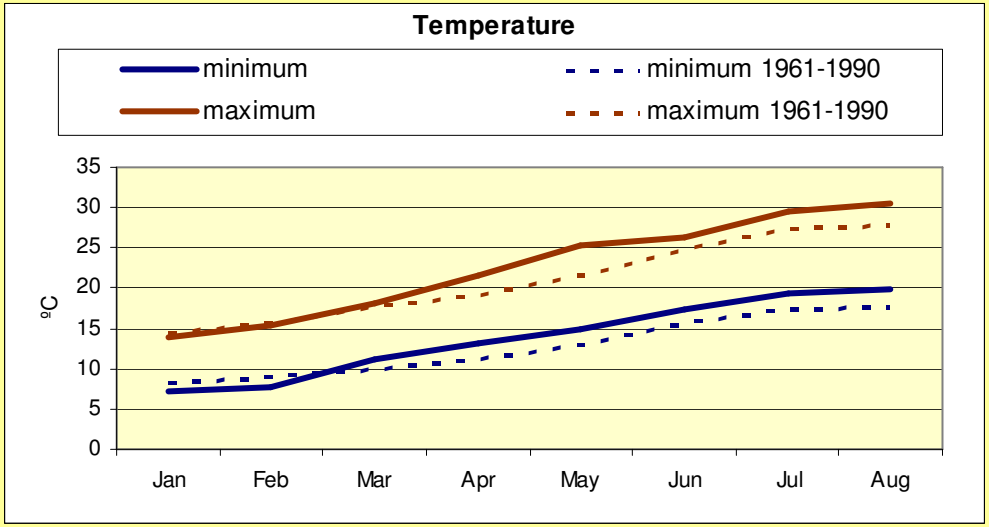
✓ **Due to the fact that the fields were sowed earlier than in the first two years, also contributed to the good results obtained in this reporting period.**

✓**Part of the problems experienced in the two first years, namely the intrusion of animals in the field, was clearly eliminated.**

✓ **Some goats invaded the fields in the end of August (only during one day). No damage was done in the fields except that they liked the leaves of the plants. Tainung 2 better tham Everglades 41.**

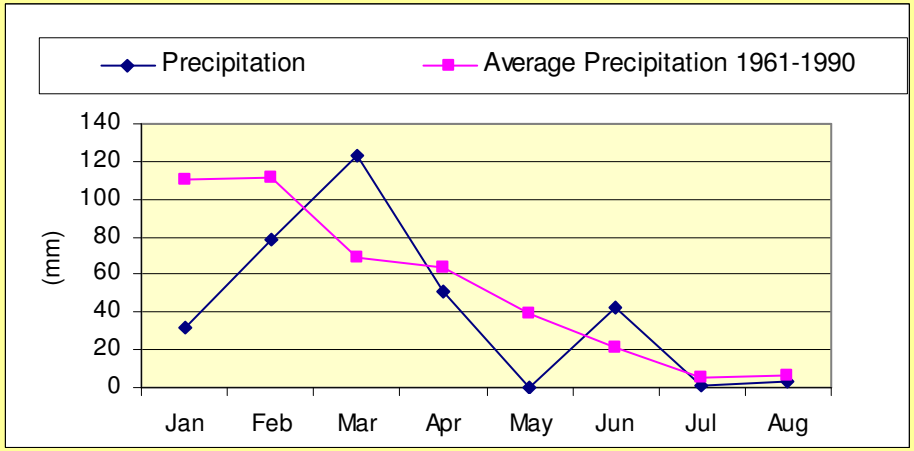
Climatic conditions at Monte de Caparica

2006



Temperatures:

slightly higher than normal values 1961-1990 (1,1 tmin- 1,5ºC tmáx)



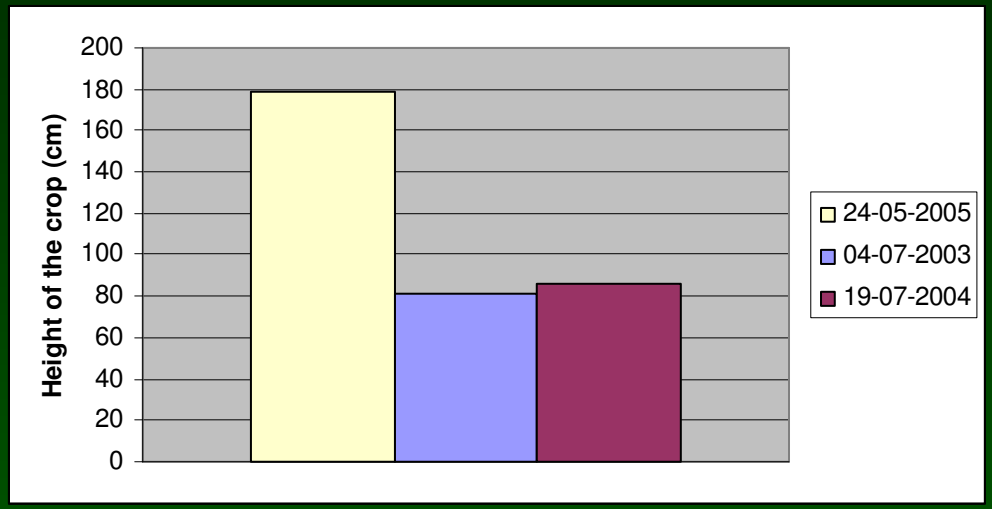
Precipitation, lower than normal values 1961-1990

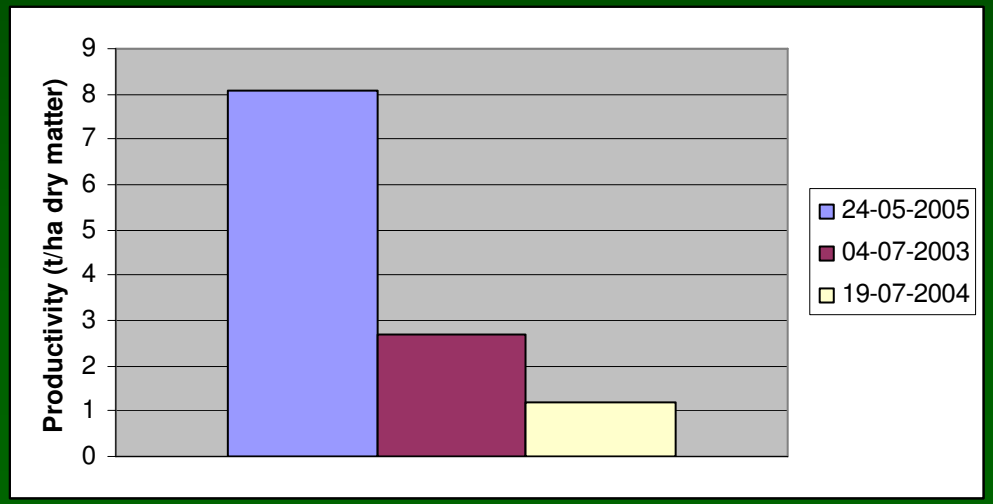
2006 is being a dry year, exceptions in March and June

Growth stages

Emergence 50%	**5 ± 2 days after sowing**
Total emergence of seeds	**65 ± 5 %**
Half-bloom > 50%	**Not yet (26th September)**
Physiological maturity > 50%	**Not yet (26th September)**

Sowing dates





Best sowing date:

May

Question:
Will be a difference between sowing at 24th May (2005) and 4th May (2006)?

May be we can't answer, because 24th May sowing was with Tainung 2 and 4th May sowing was with Everglades 41

Irrigation levels

mm H20	2003	2004	2005
I_{100}	400	448	842
I_{50}	301	350	559
I_{25}	253	300	418
I_0	204	251	277

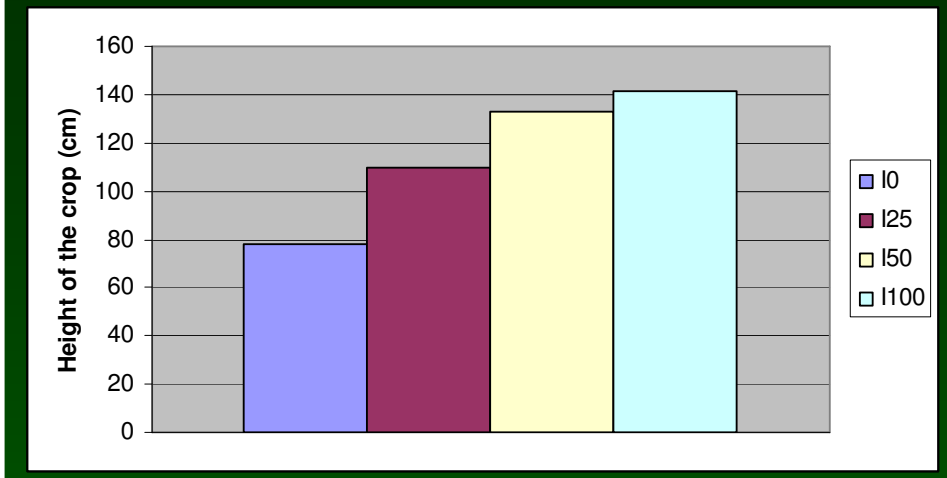
2005, major quantity of water used, but a larger period of irrigation

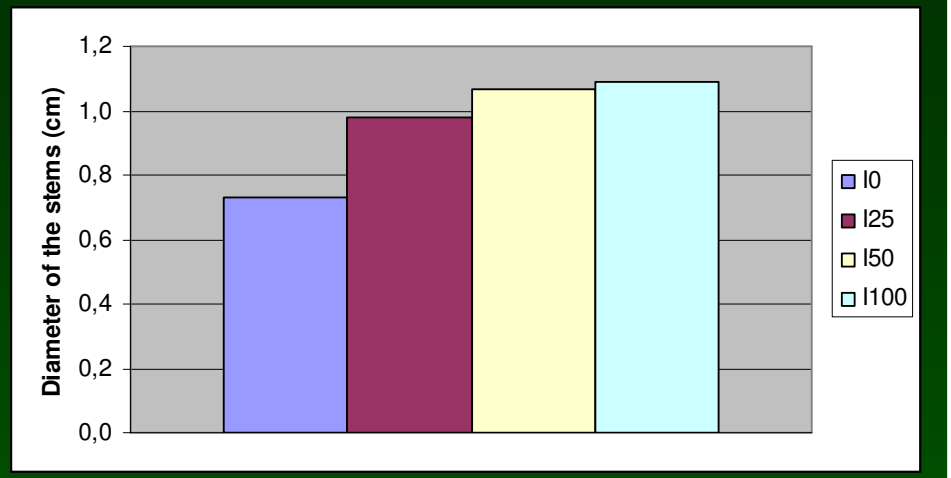
2003 – 4th July – 30th September

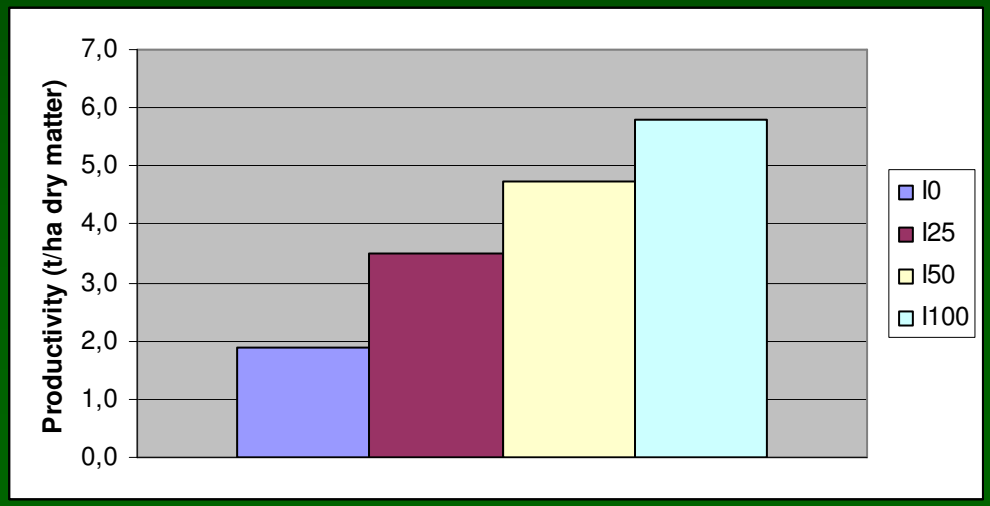
2004 – 19th July – 30th September

2005 – 24th May – 30th September

Irrigation levels



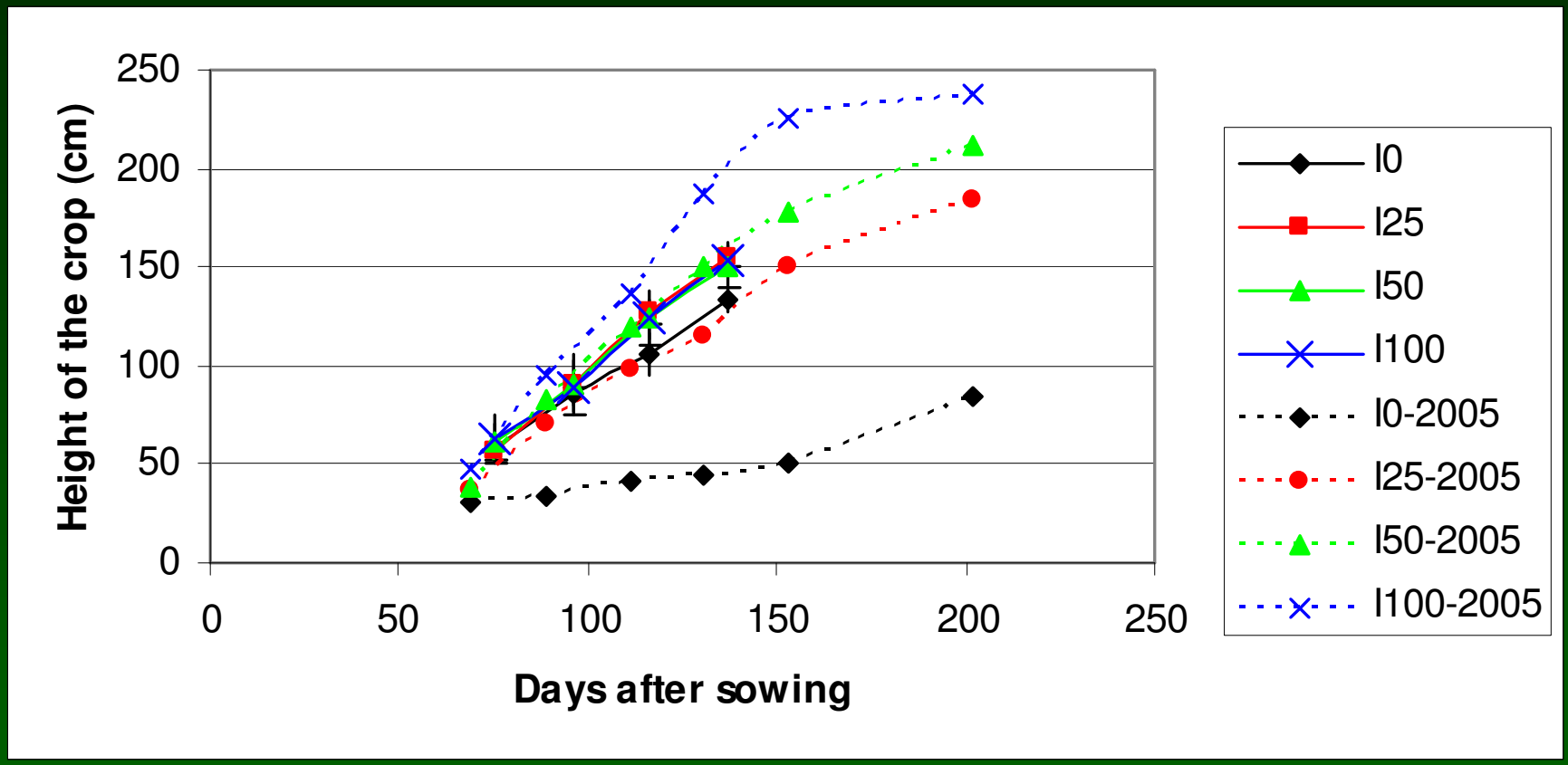




Significant differences among irrigation levels,

$$I_0 <<< I_{25} < I_{50} < I_{100}$$

Comparison between 2005 and 2006

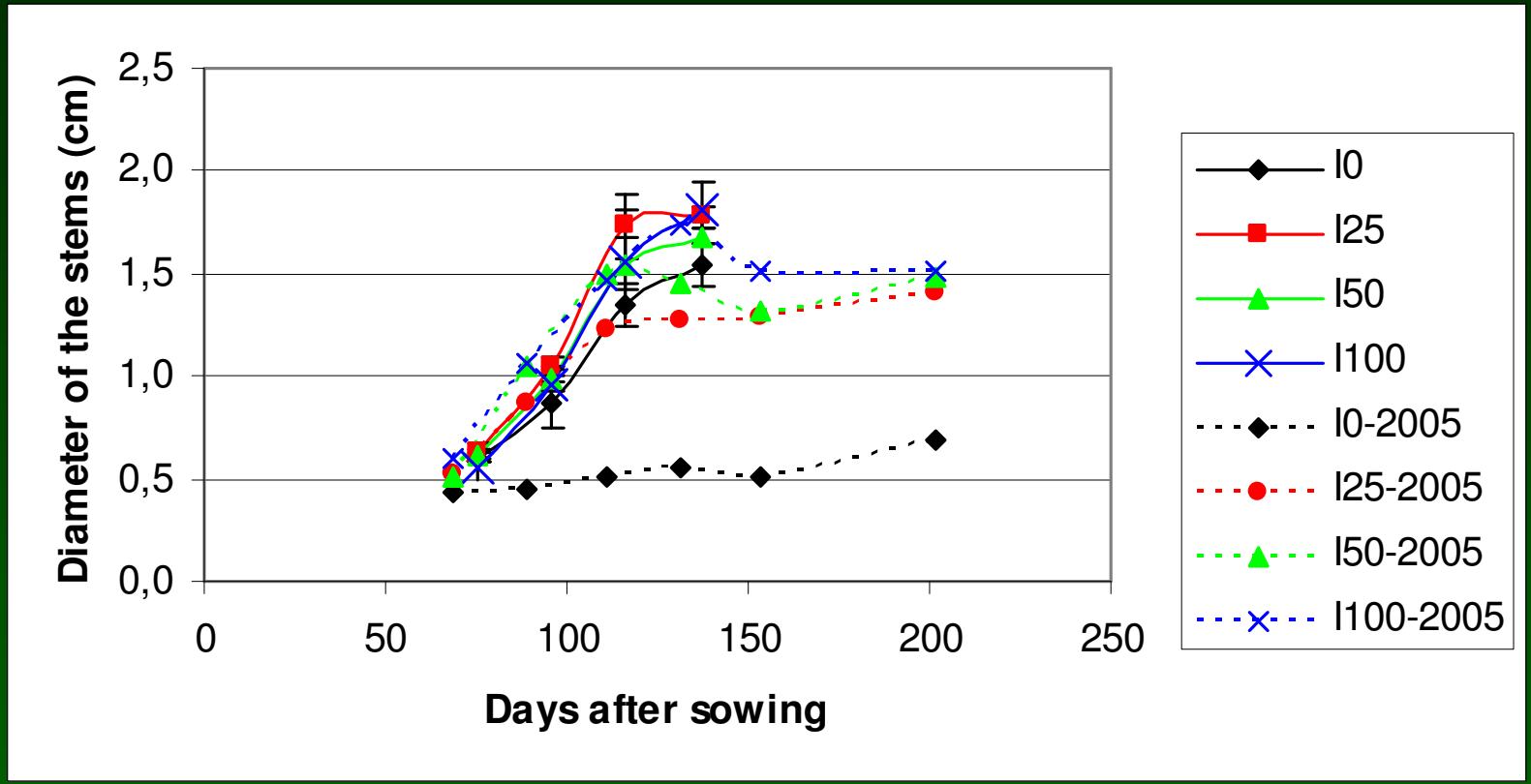


Significant differences among irrigation levels,

$$I_0 << I_{25} = I_{50} = I_{100}$$

2006, better results for I_0 and I_{25}. I_{50}, equal results, I_{100} lower height

Comparison between 2005 and 2006

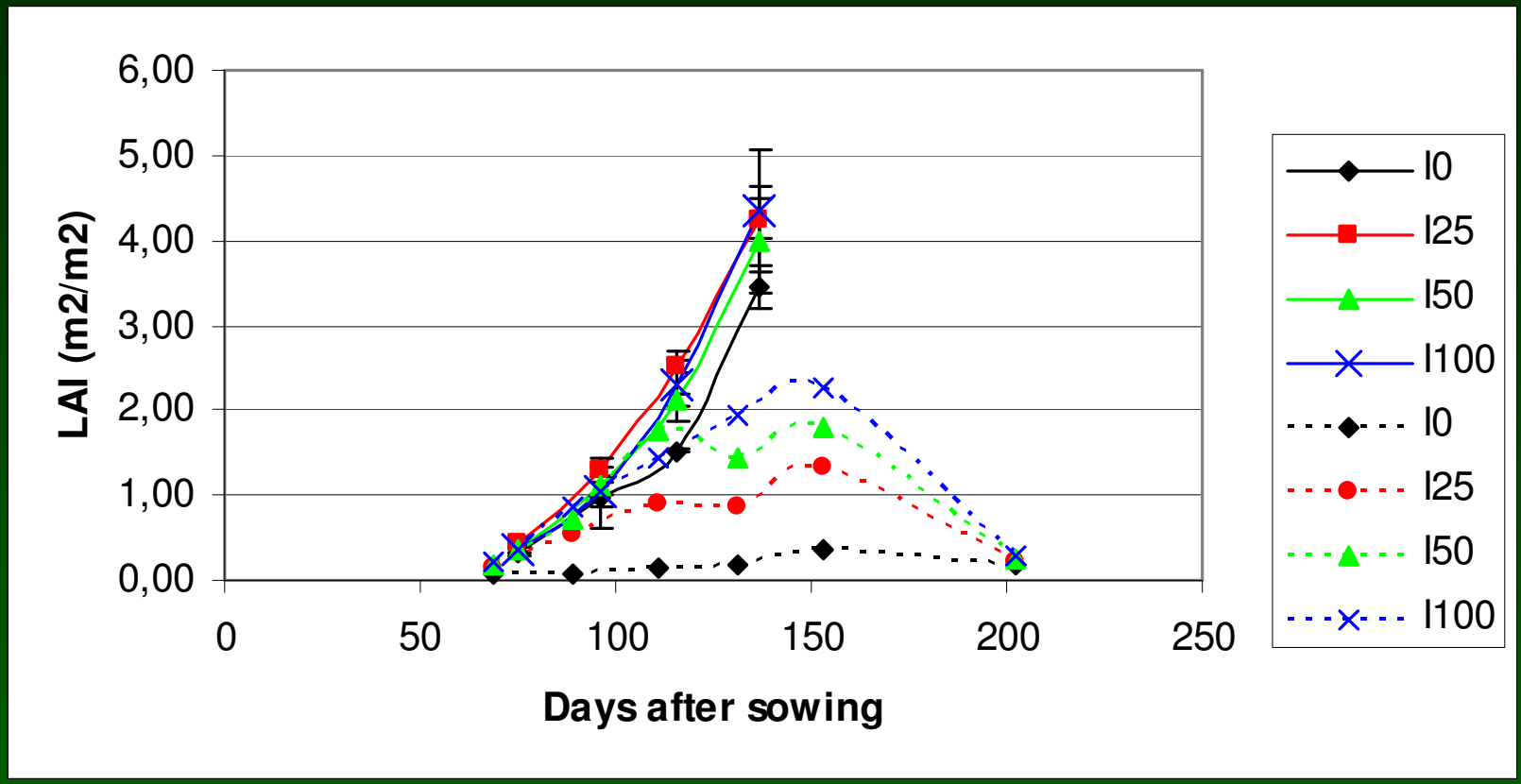


Significant differences among irrigation levels,

$$I_0 << I_{25} = I_{50} = I_{100}$$

2006, better results for I_0, I_{25} and I_{50}, I_{100} equal diameter

Comparison between 2005 and 2006

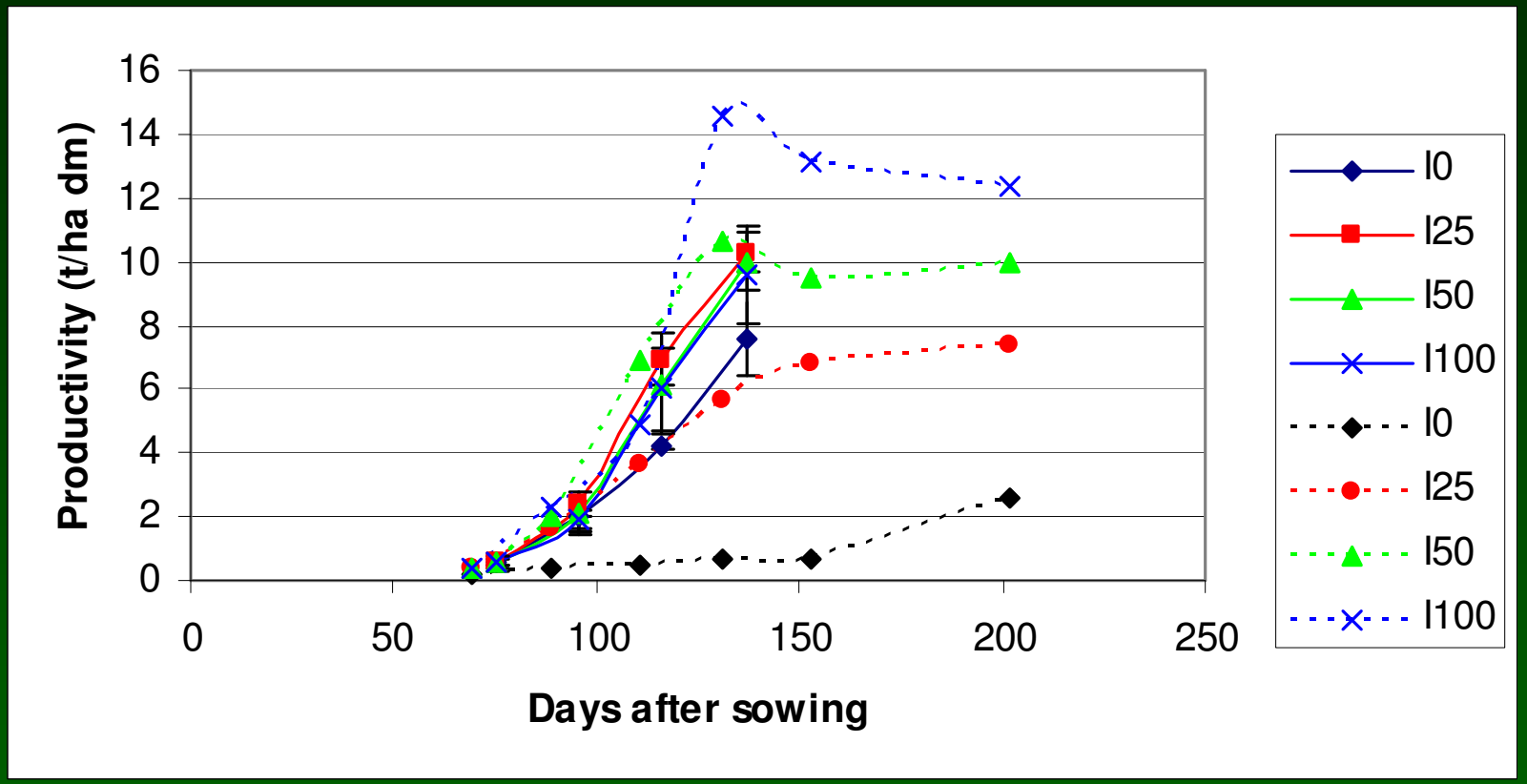


Significant differences among irrigation levels,

$$I_0 << I_{25} = I_{50} = I_{100}$$

2006, better results (may be because it is Everglades 41!)

Comparison between 2005 and 2006



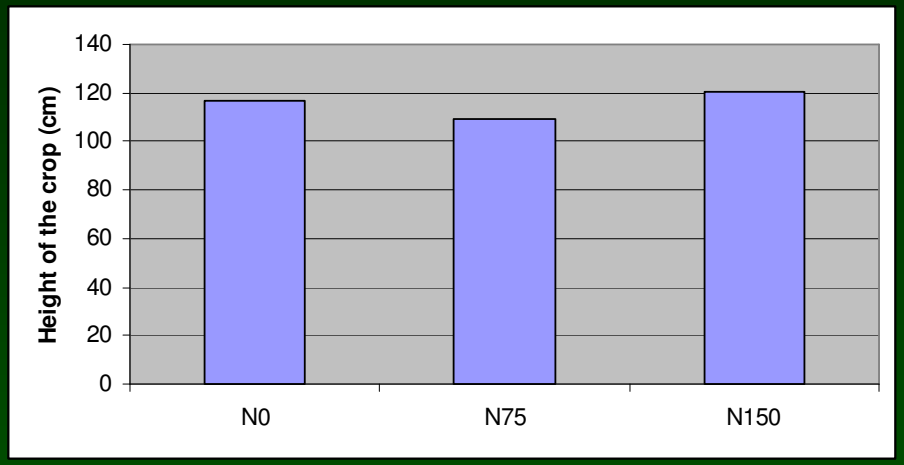
Significant differences among irrigation levels,

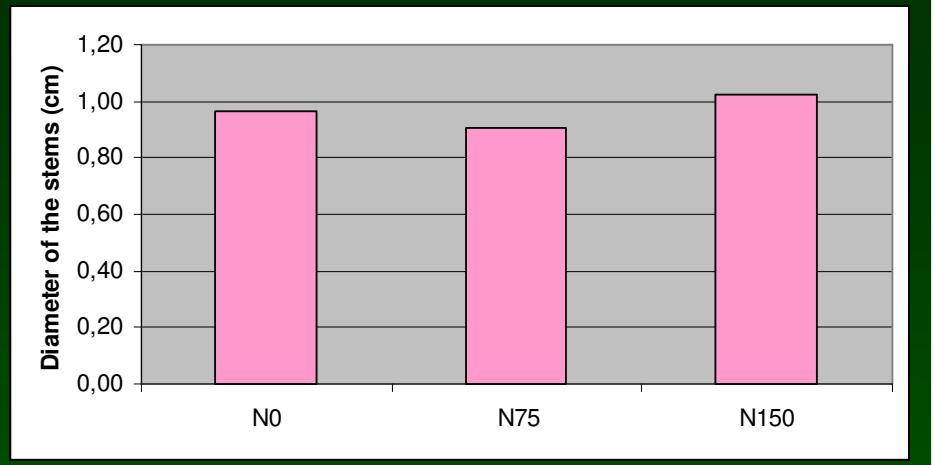
$$I_0 << I_{25} = I_{50} = I_{100}$$

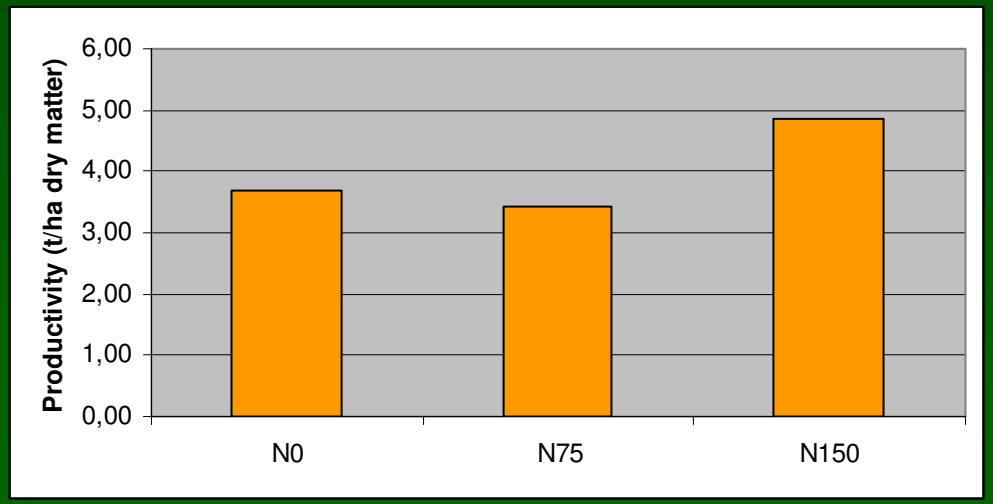
2006,

better results for I_0 and I_{25}. I_{50}, equal results, I_{100} lower productivity

Nitrogen levels

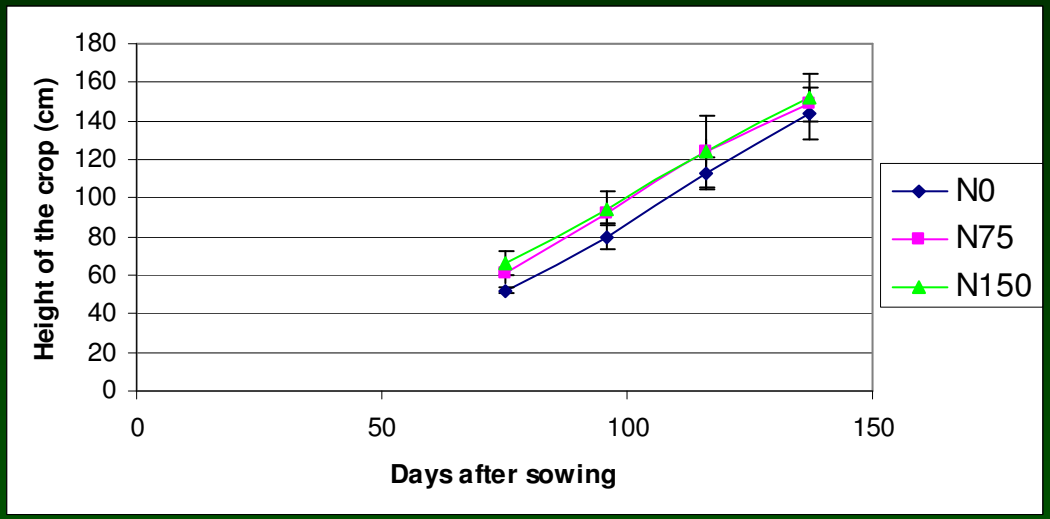


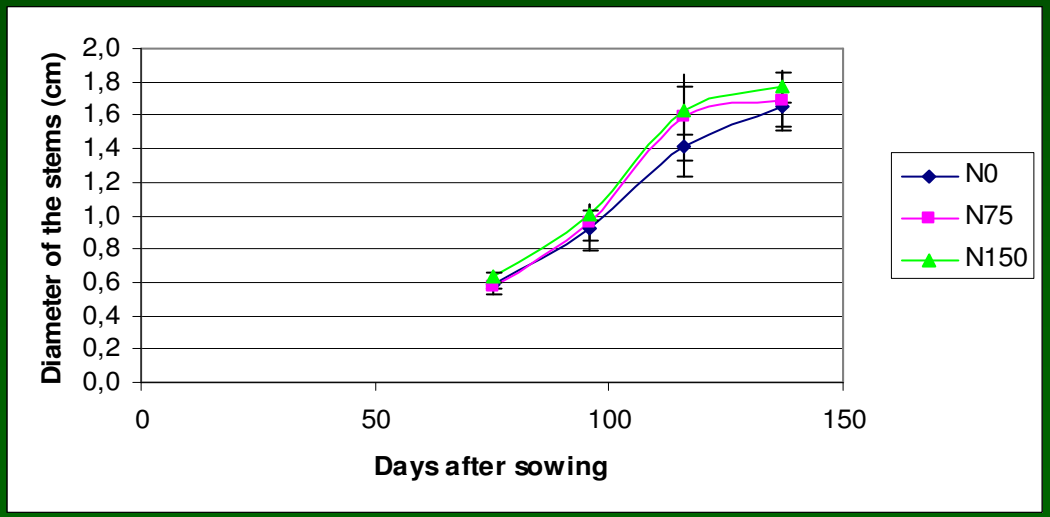




No differences among N-fertilization levels, althought N_{150} presents higher productivities

Nitrogen levels, 2006 results

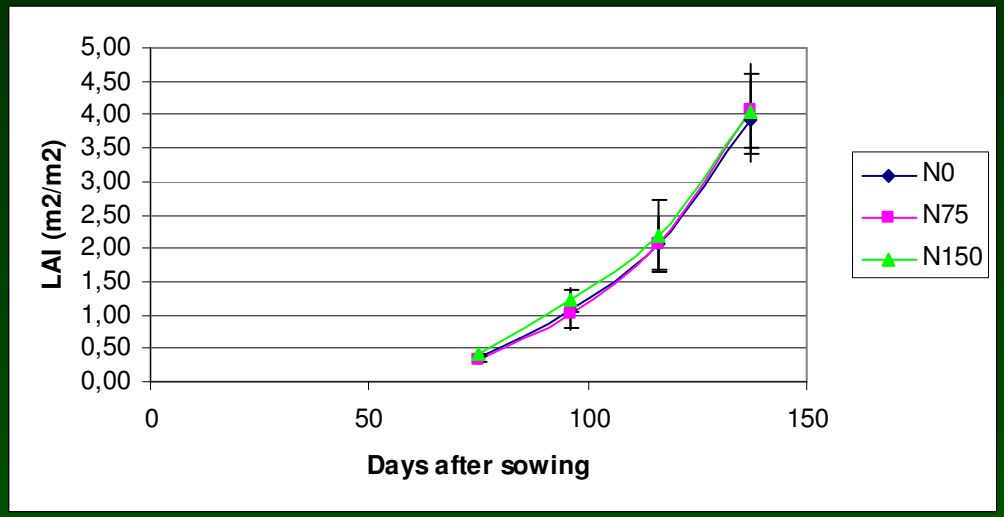


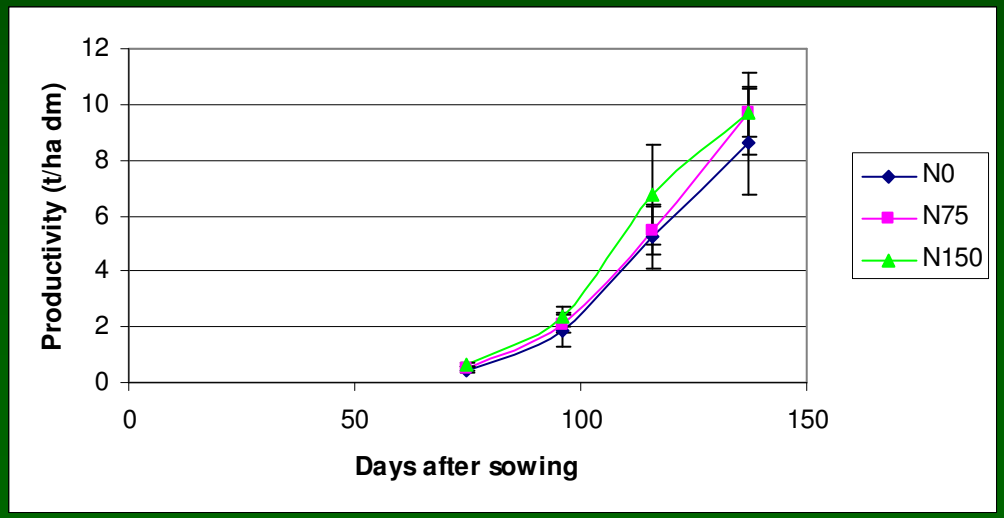


No differences among N-fertilization levels,

although N_0 presents lower results

Nitrogen levels, 2006 results





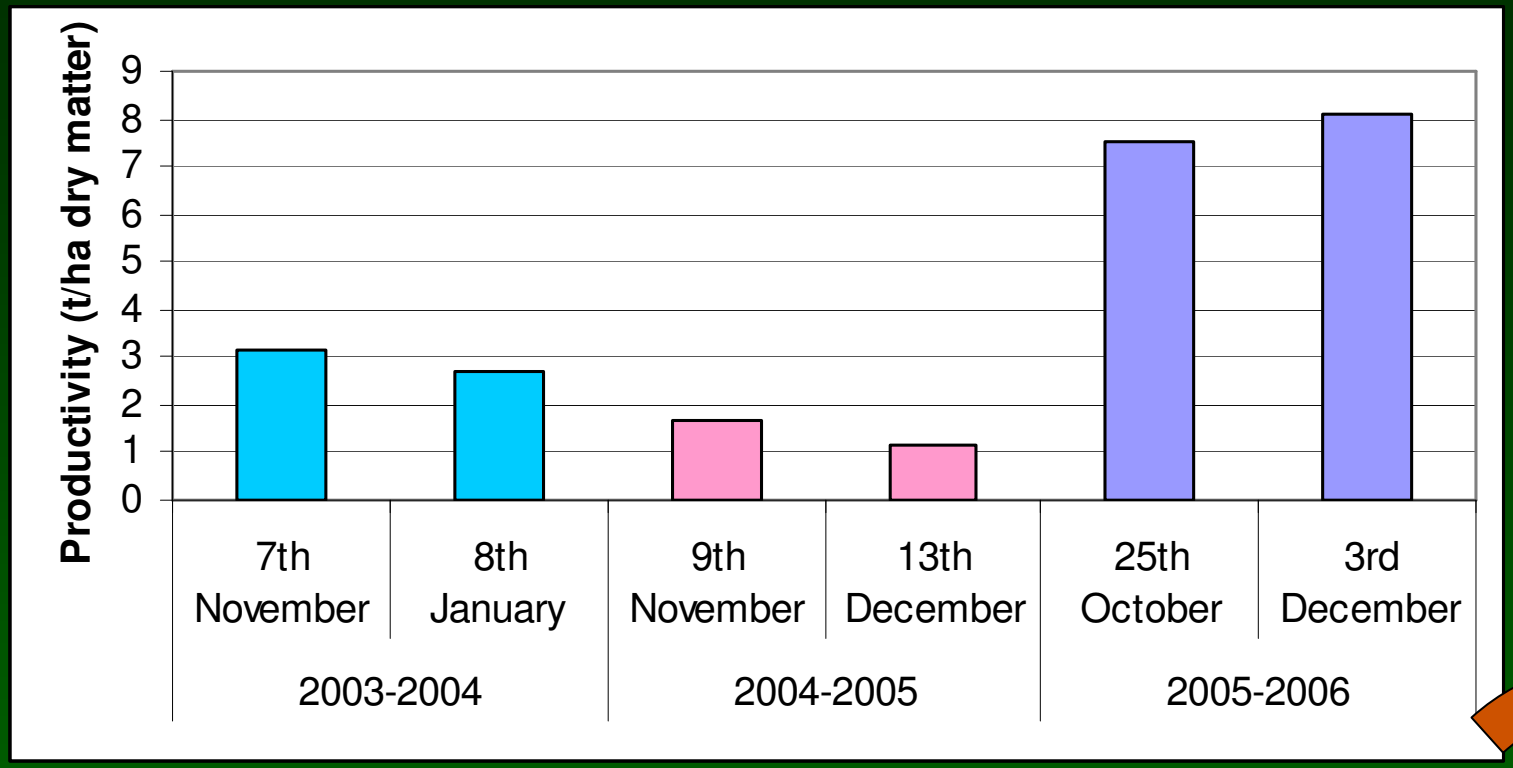
No differences among N-fertilization levels,

althought

$N_0 < N_{75} < N_{150}$

(in terms of productivity)

Harvest dates



No significative differences, between October and January harvests (in terms of productivity)

Are there differences in quality? October harvest is better?