WP2
Adaptability and Productivity Field Trials

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Task 2.2 – Effect of different sowing dates and plant populations on biomass yields

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

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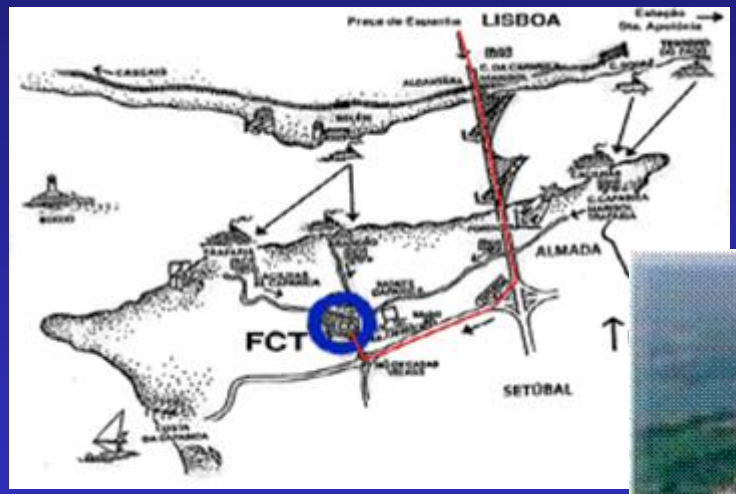
Experimental fields

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



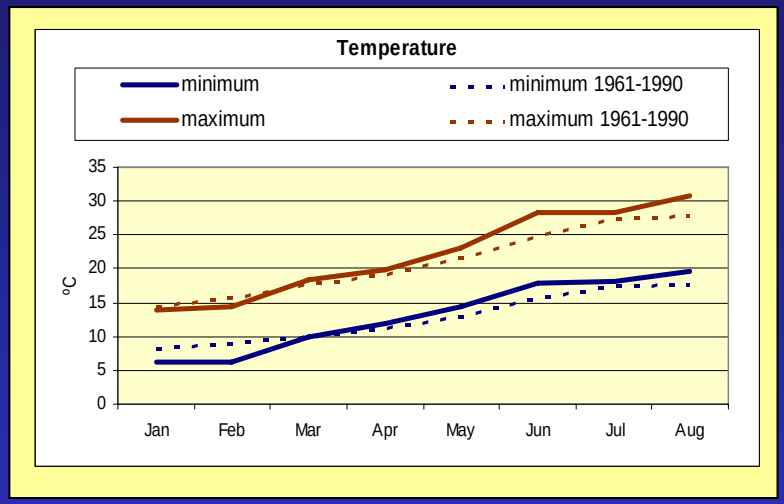
Fields

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

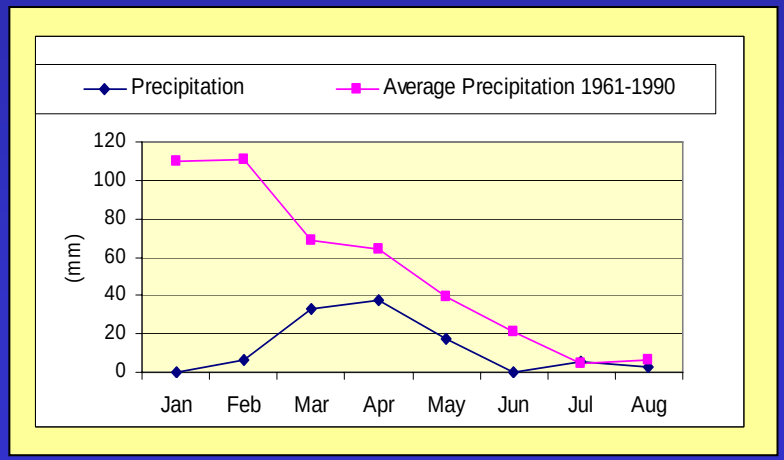
Urban area near the Atlantic coast and the estuarine zone

Climatic conditions at Monte de Caparica

During the first seven months of 2005



Temperatures, minimum and maximum, higher than normal values 1961-1990, March onwards. Lower then normal values in January and February



Precipitation, much lower than normal values 1961-1990. 2005 is being a very dry year.

Task 2.2

– Effect of different sowing dates and plant populations on biomass yields

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

S_1: 04/5/2005
S_2: 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

Growth stages

	Tainung 2				Everglades 41			
	D_1		D_2		D_1		D_2	
	S_1	S_2	S_1	S_2	S_1	S_2	S_1	S_2
Emergence 50%	6±1	6±1	9±4	7±2	7±2	7±2	9±5	6±1
	Days after sowing							
Total emergence of seeds	**Tainung 2 – 83±5 %; Everglades 41 – 86±6 % 4th May – 85±9 %; 15th June – 83±5 % 20 seeds/m2 – 88±5 %; 40 seeds/m2 – 80±6 %**							
Half-bloom > 50%	**S_1 – 07/10/2005, 156 ± 3 days after S_1 S_2 – 10/10/2005, 117 ± 5 days after S_2, 160 ± 5 days after S_1**							
Physiological maturity > 50%	**It was not achieved yet (at 16 November, 196 days after S_1)**							

Tainung 2

Everglades 41

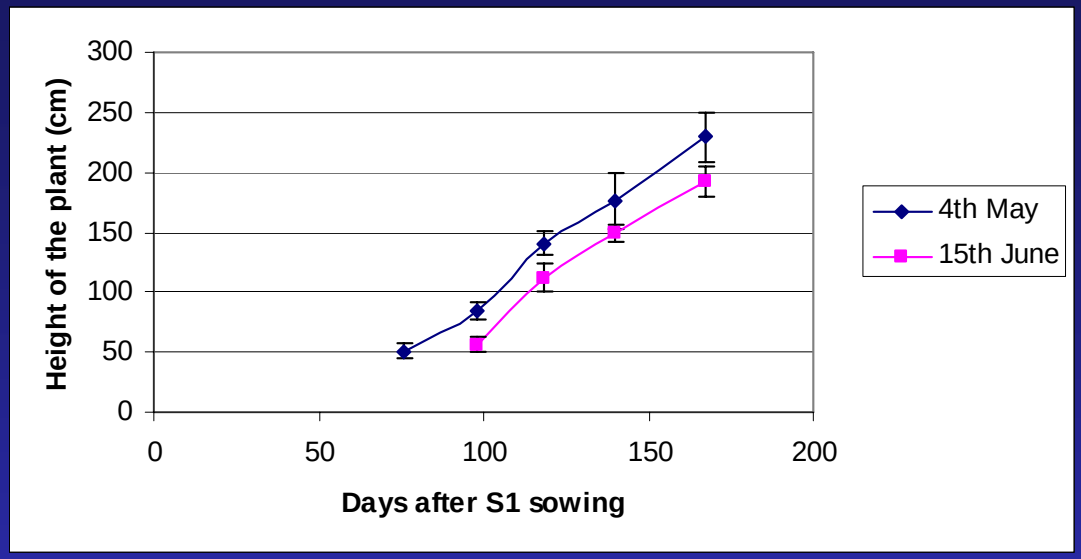
S1

S2

Plants with 107 days after S_1 sowing (19th August 2005)

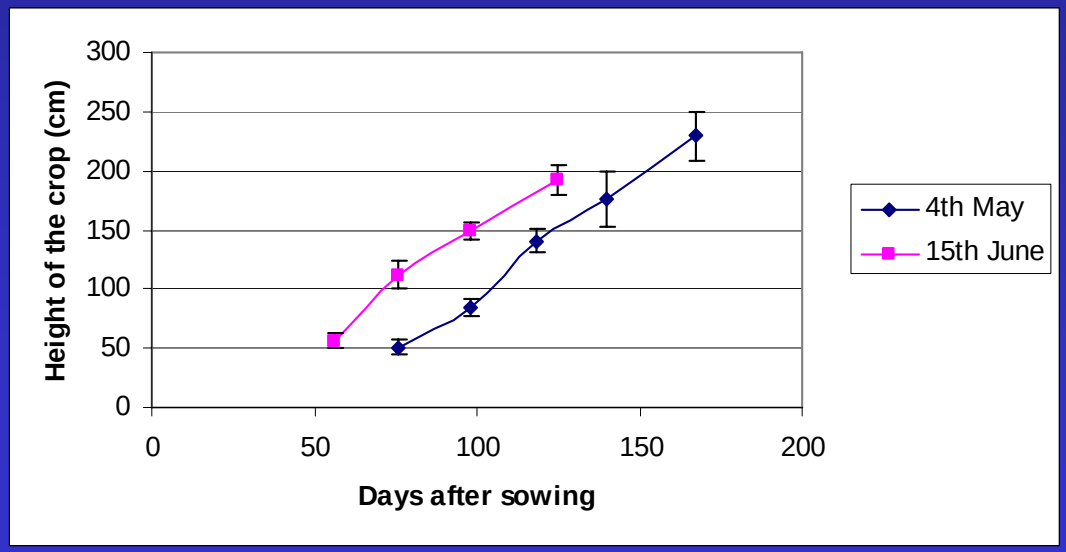
Plants with 107 days after S_1 sowing (19th August 2005)

Height of the crop



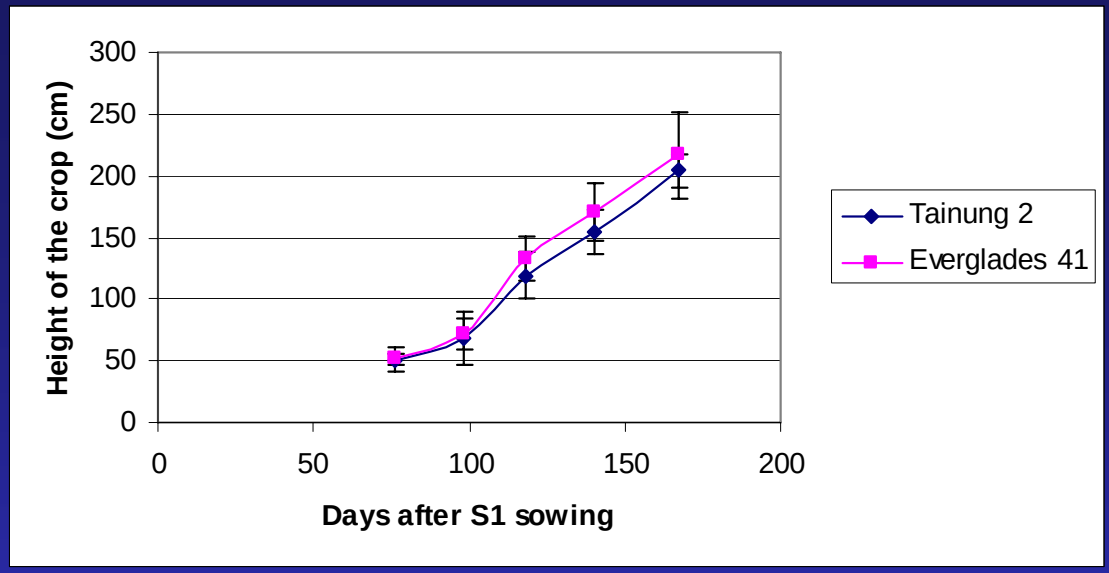
S1 >> S2

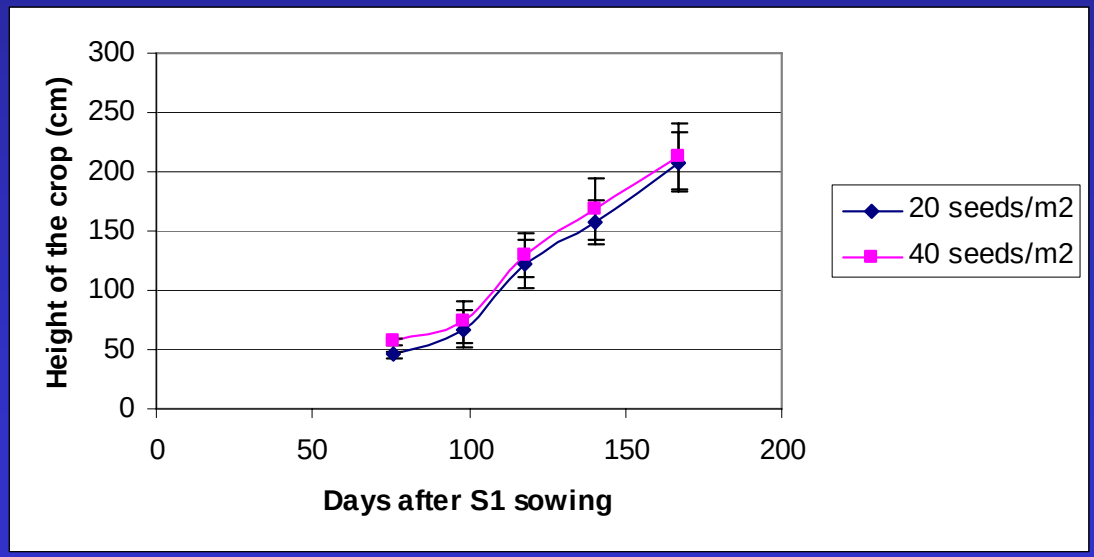
significantly



But when comparing both crops in days after sowing, the later sowing date crop show a crop that grows faster then s1 sowing date

Height of the crop



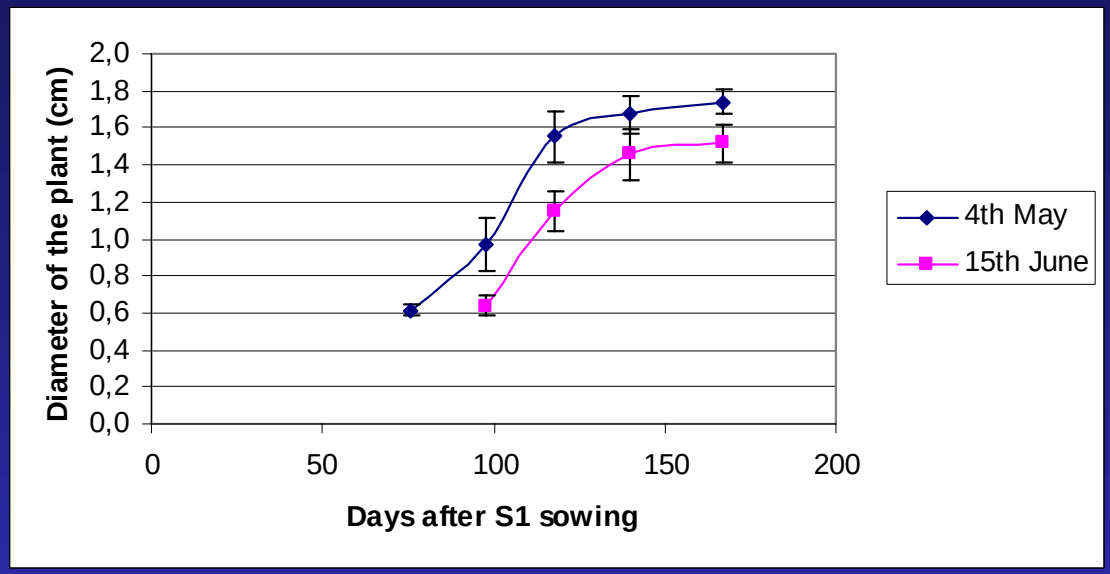


Everglades 41 > Tainung 2,

D2 > D1,

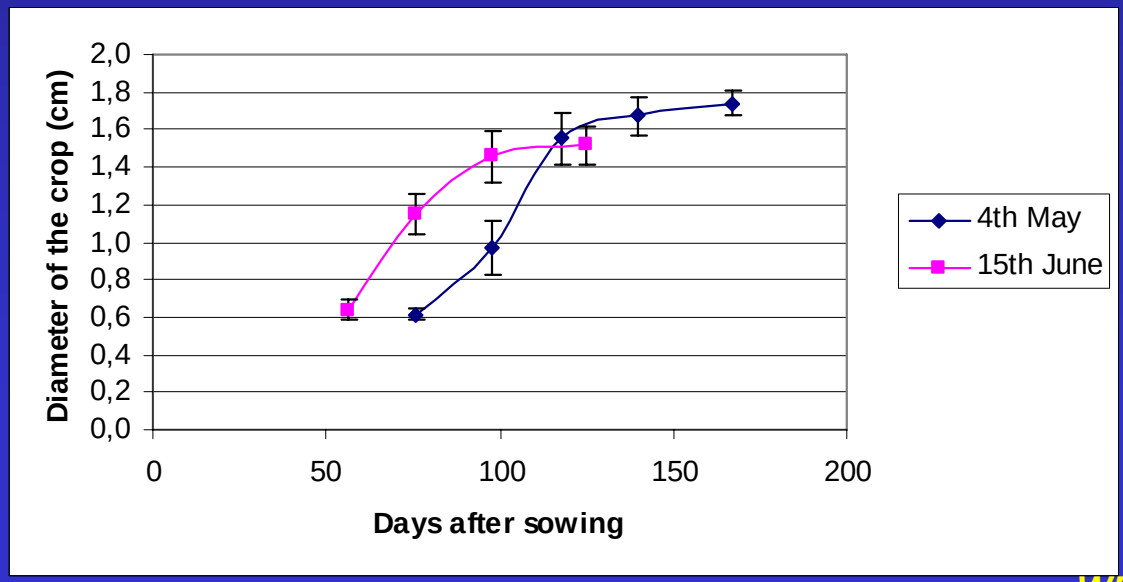
but differences are not significant

Diameter of the crop

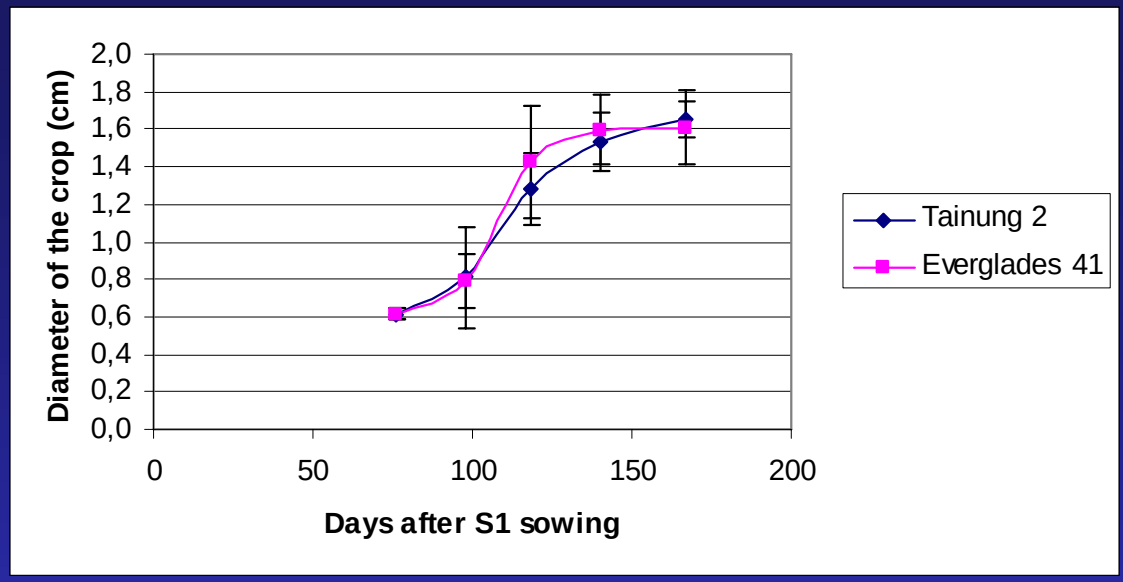


Same behaviour as for the height of the crop

S1>>>S2

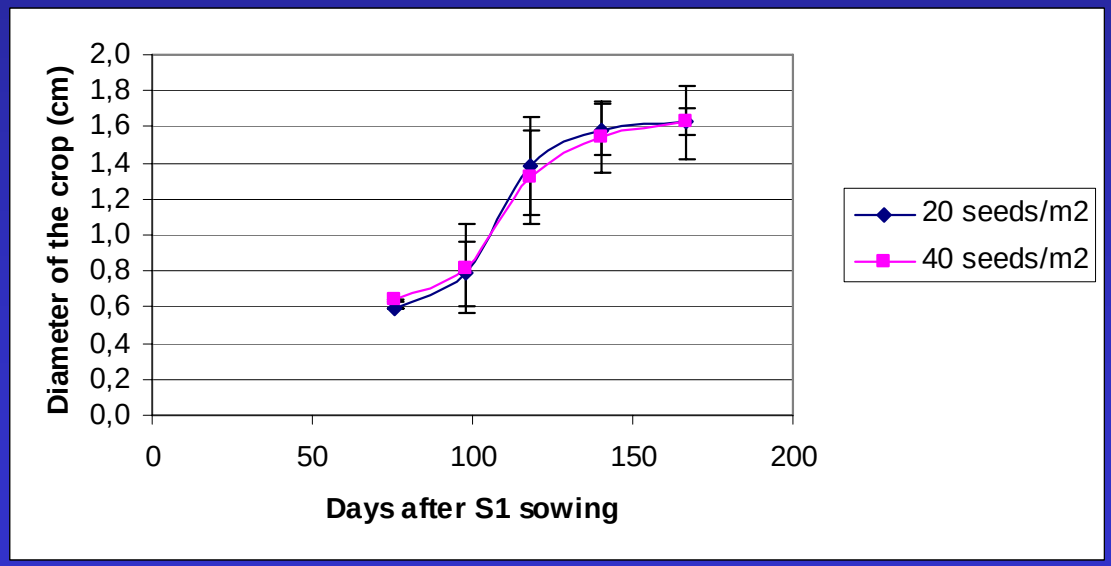


Diameter of the crop



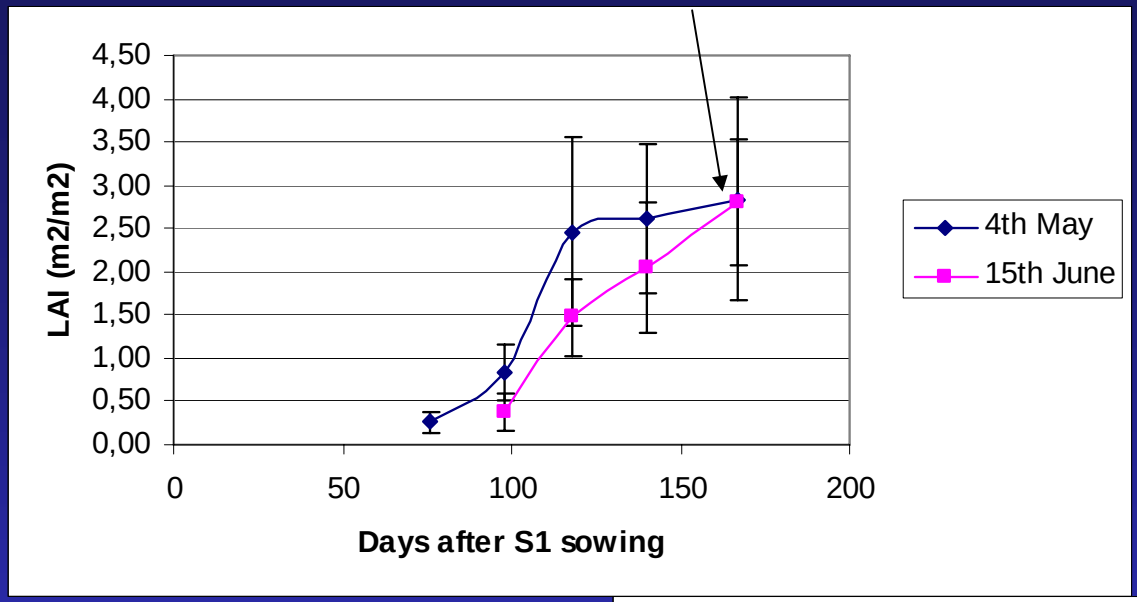
Tainung 2 = Everglades 41

D1 = D2



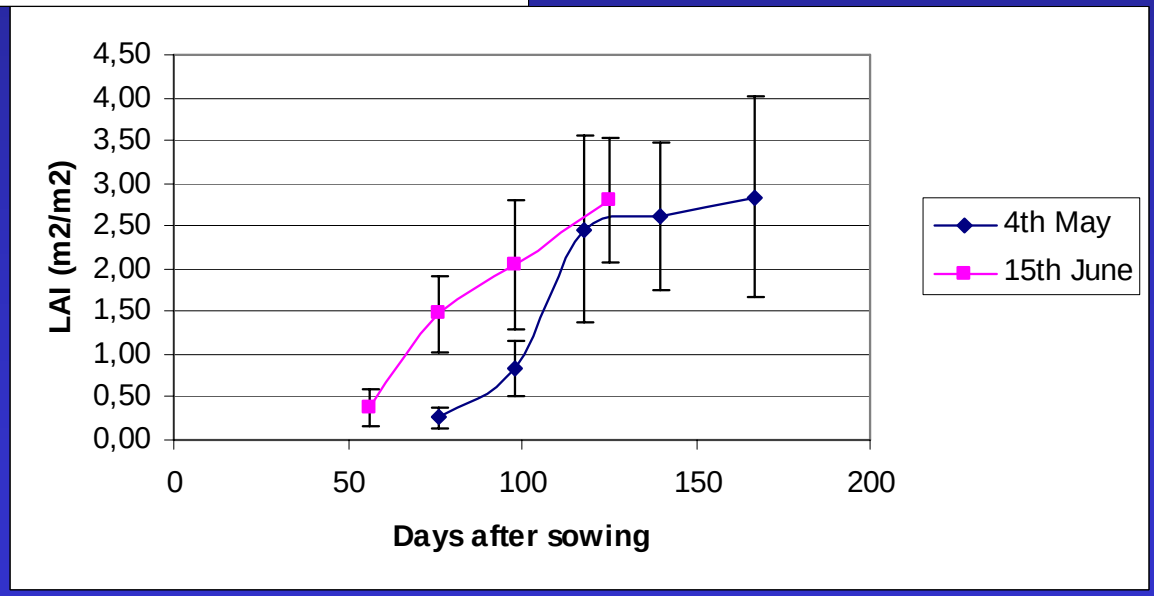
LAI

18th October

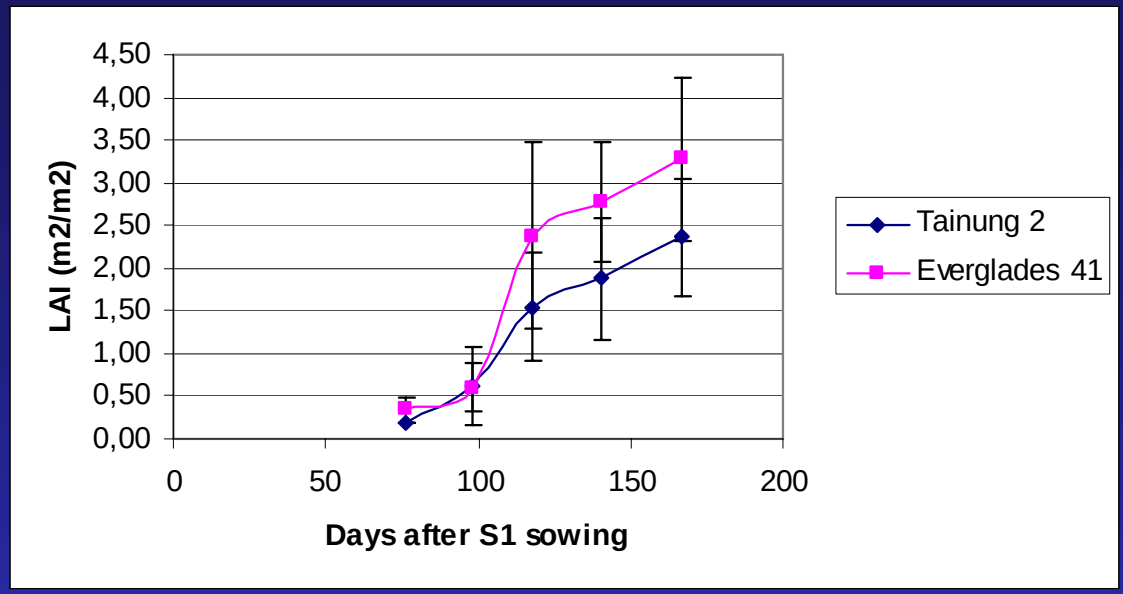


In the middle of October, no differences between S1 and S2

No significant differences between S1 and S2 after 120 days after sowing

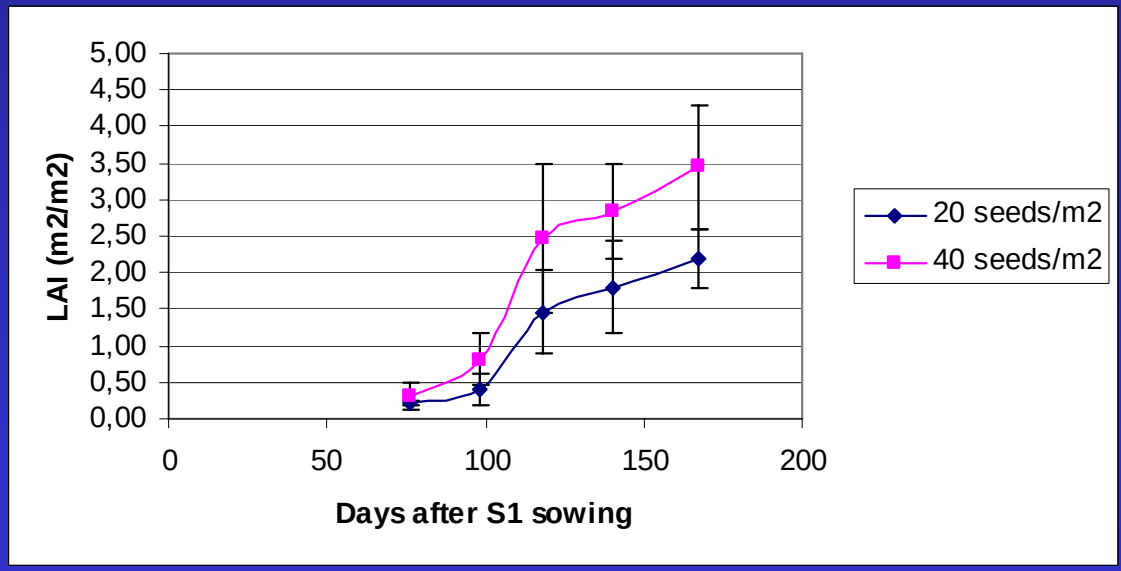


LAI

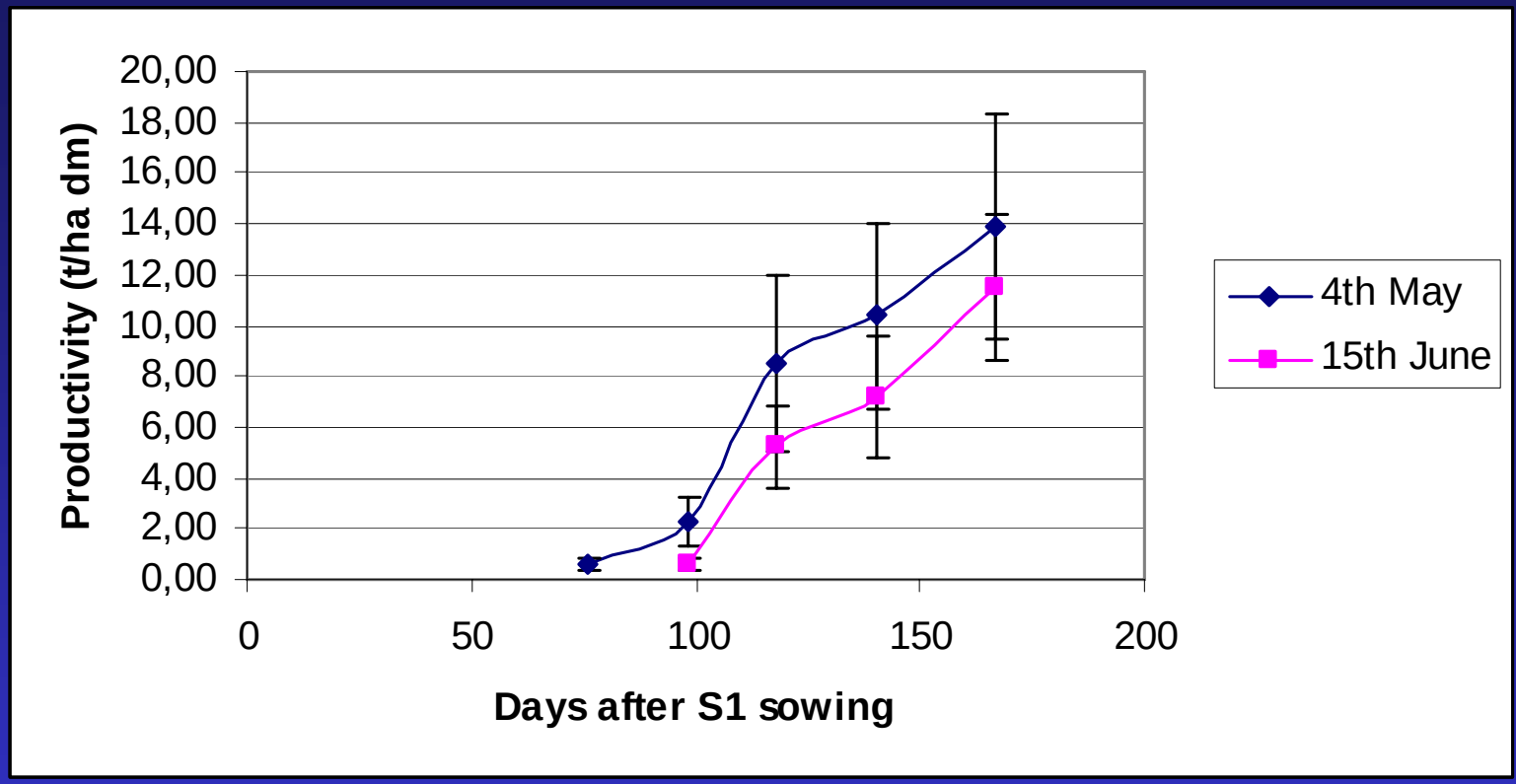


Everglades 41 >>> Tainung 2

D2>>>D1

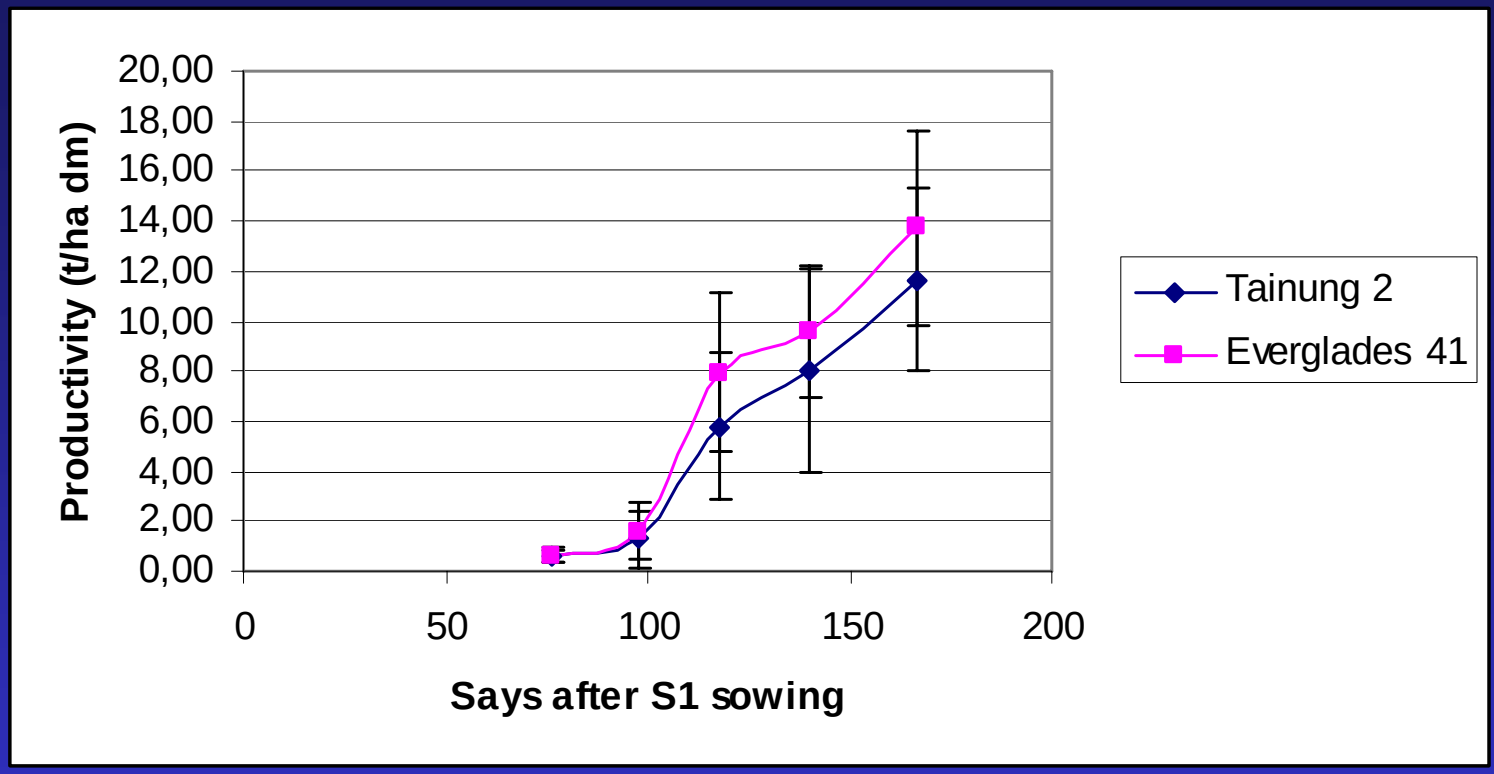


Productivity



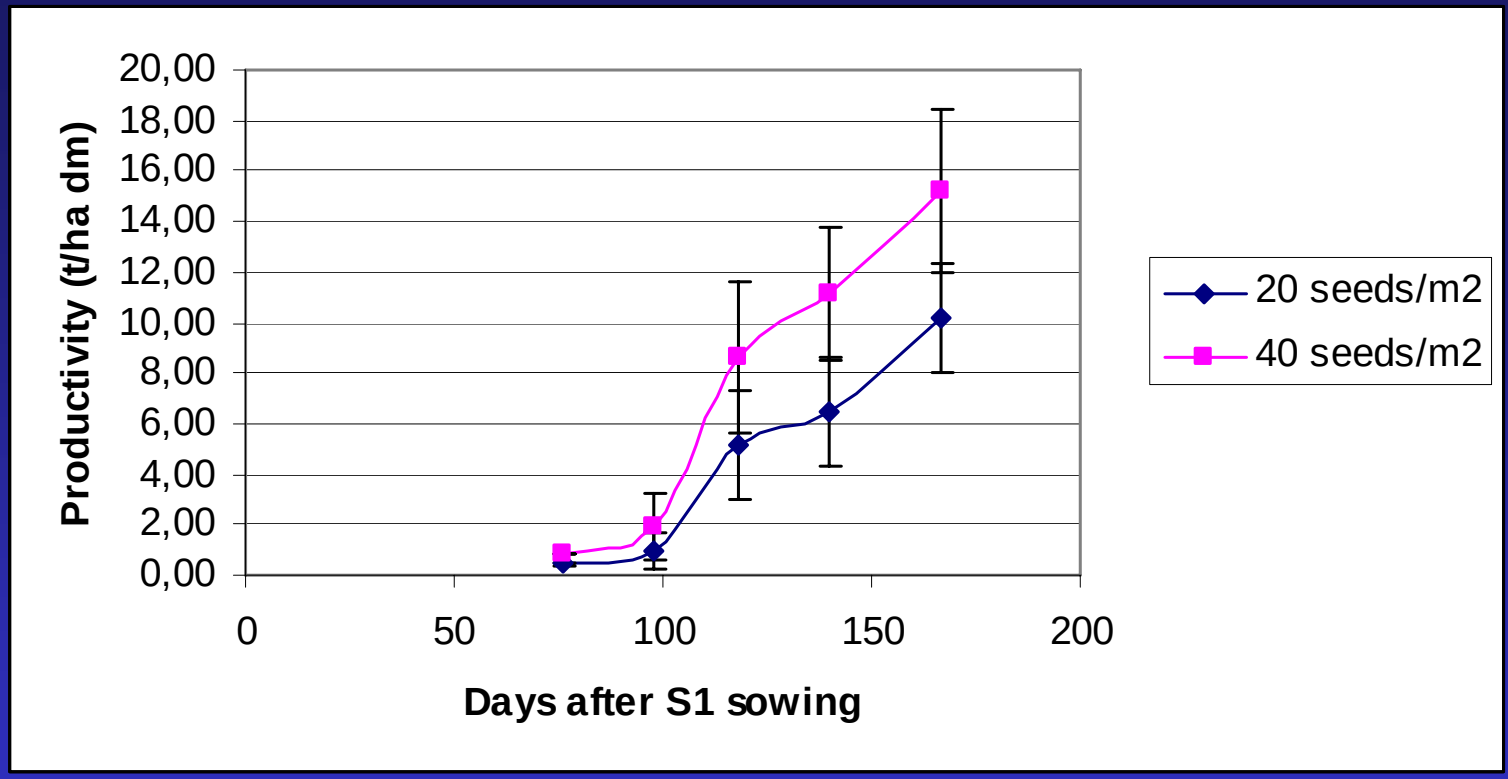
S1 higher than S2 but differences are not significant

Productivity



Everglades 41 presents higher productivities than Taining 2 but differences are not significant

Productivity



Fields with higher sowing density presents higher productivities, but differences are not significant

Task 2.3

– Effect of irrigation and nitrogen fertilization on biomass yields

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

Variety: Tainung 2
Sowing: 25/5/2005
20 plants/m^2

At early stages of growth, all the fields were fully irrigated in order to compensate the water deficit of the soil
40 days after sowing, 04/07/2005, irrigation was differentiated

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

Growth stages

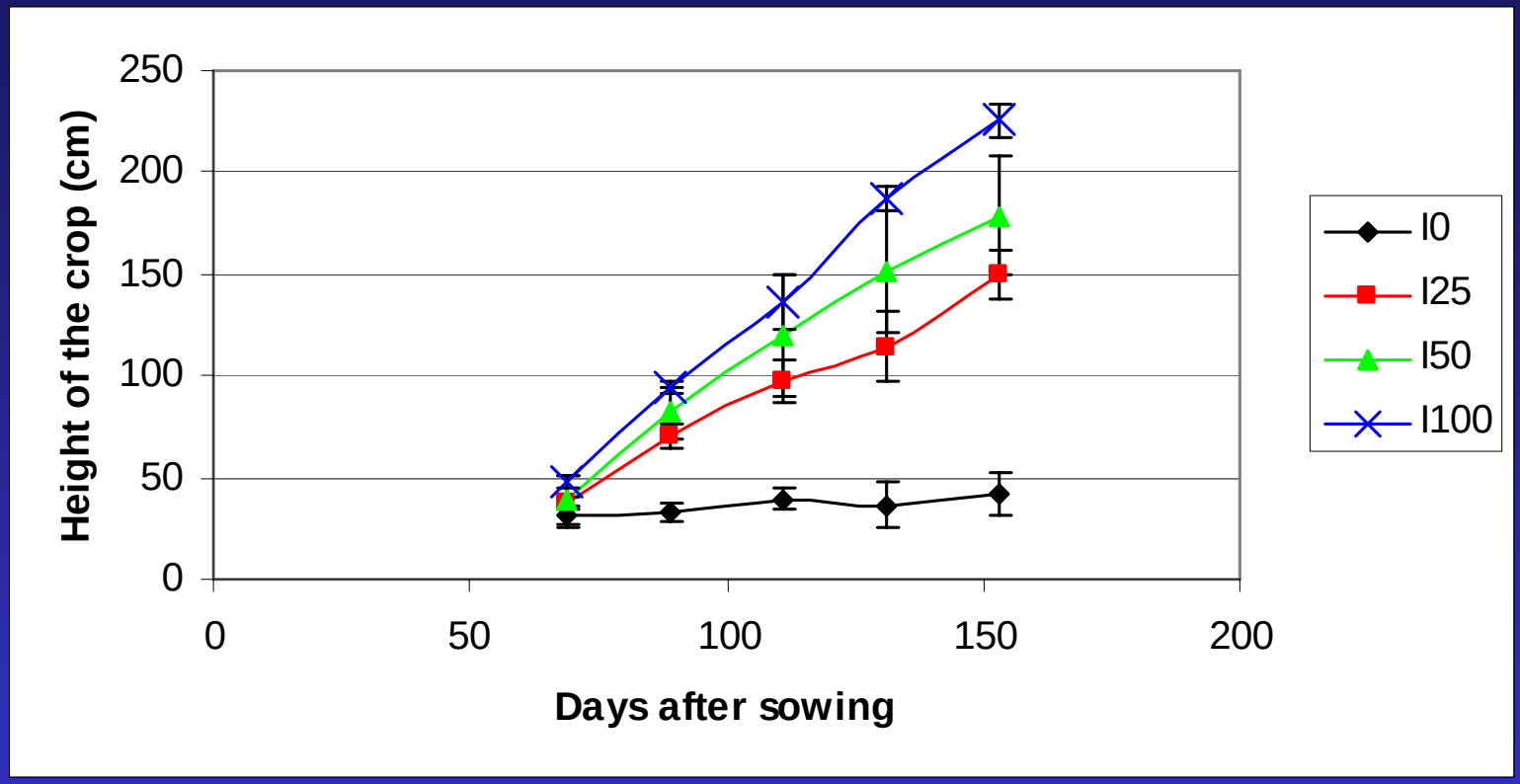
Emergence 50%	**9 ± 2 days after sowing**
Total emergence of seeds	**81 ± 8 %**
Half-bloom > 50%	**07/10/2005, 135 ± 4 days after sowing**
Physiological maturity > 50%	**It was not achieved yet (at 16 November, 175 days after sowing)**

Block II, 0% PET

Block II, 100% PET

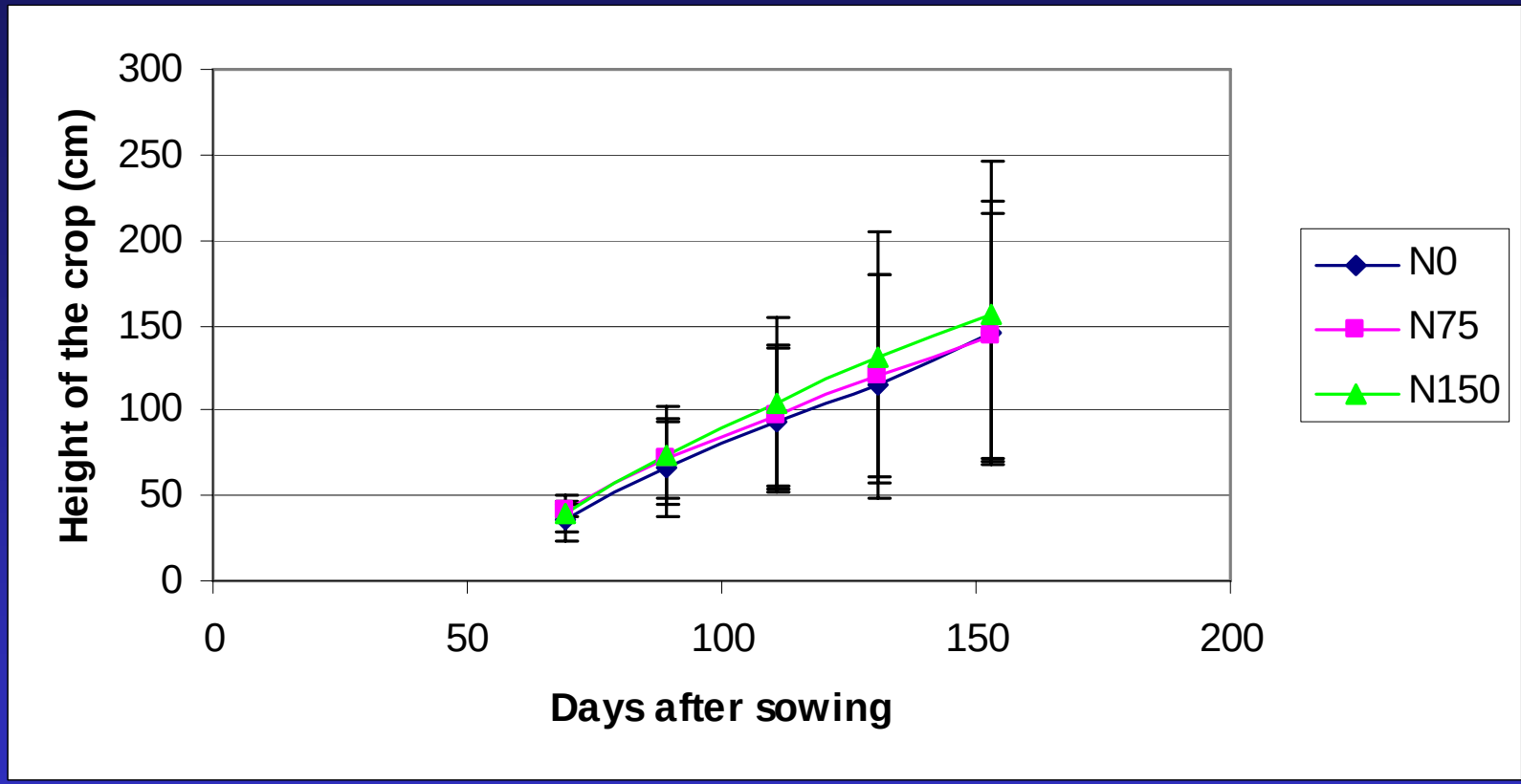
Plants with 86 days after sowing (19th August 2005)

Height of the crop



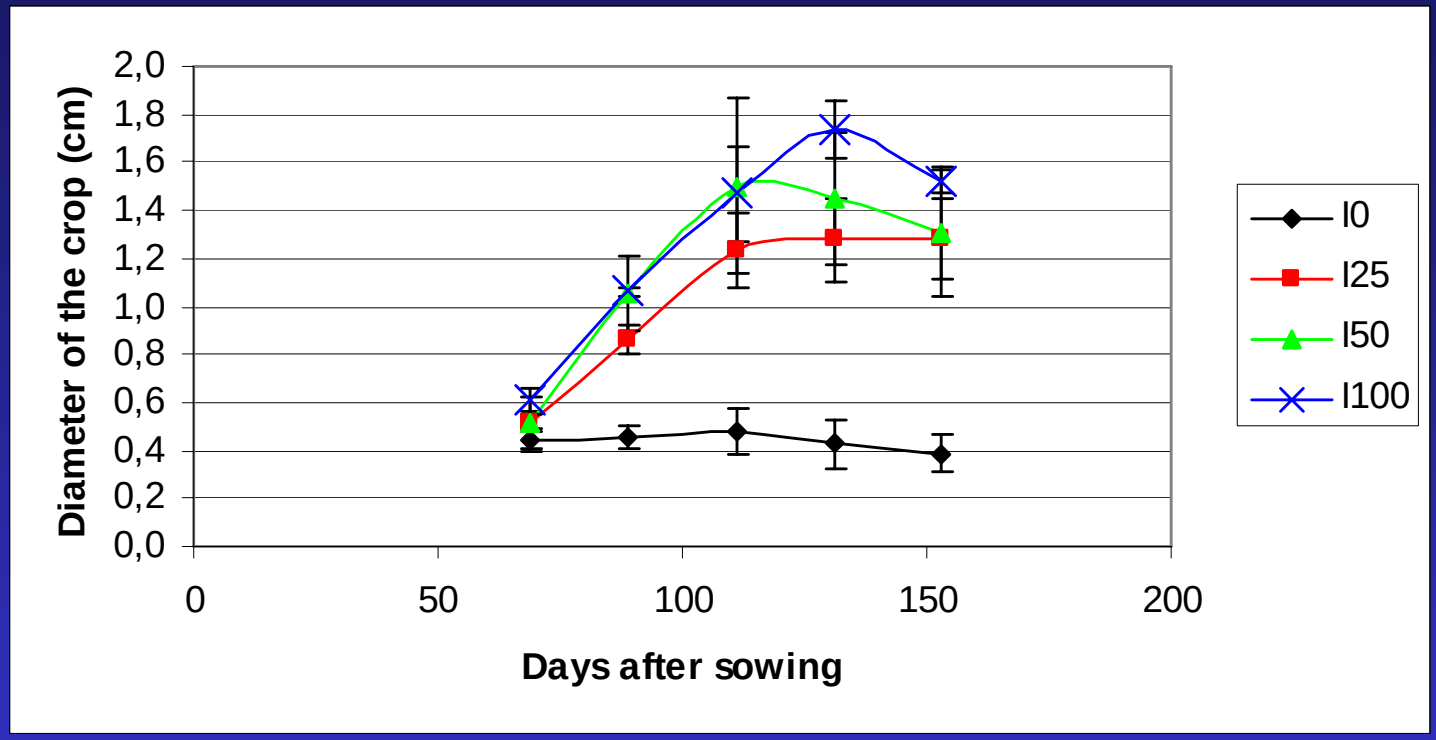
Significant differences among irrigation levels, I0 is much lower

Height of the crop



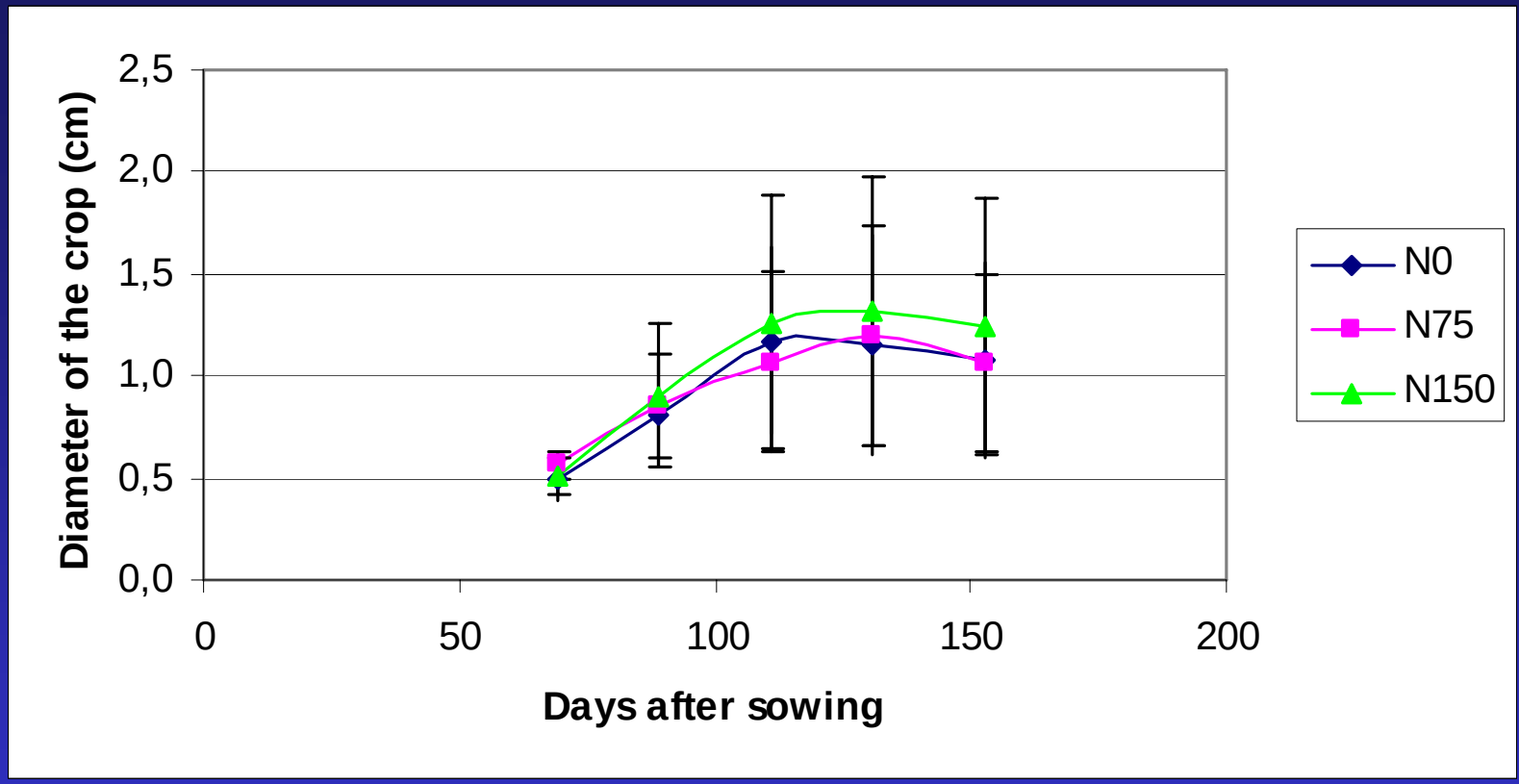
No differences among N-fertilization levels

Diameter of the crop



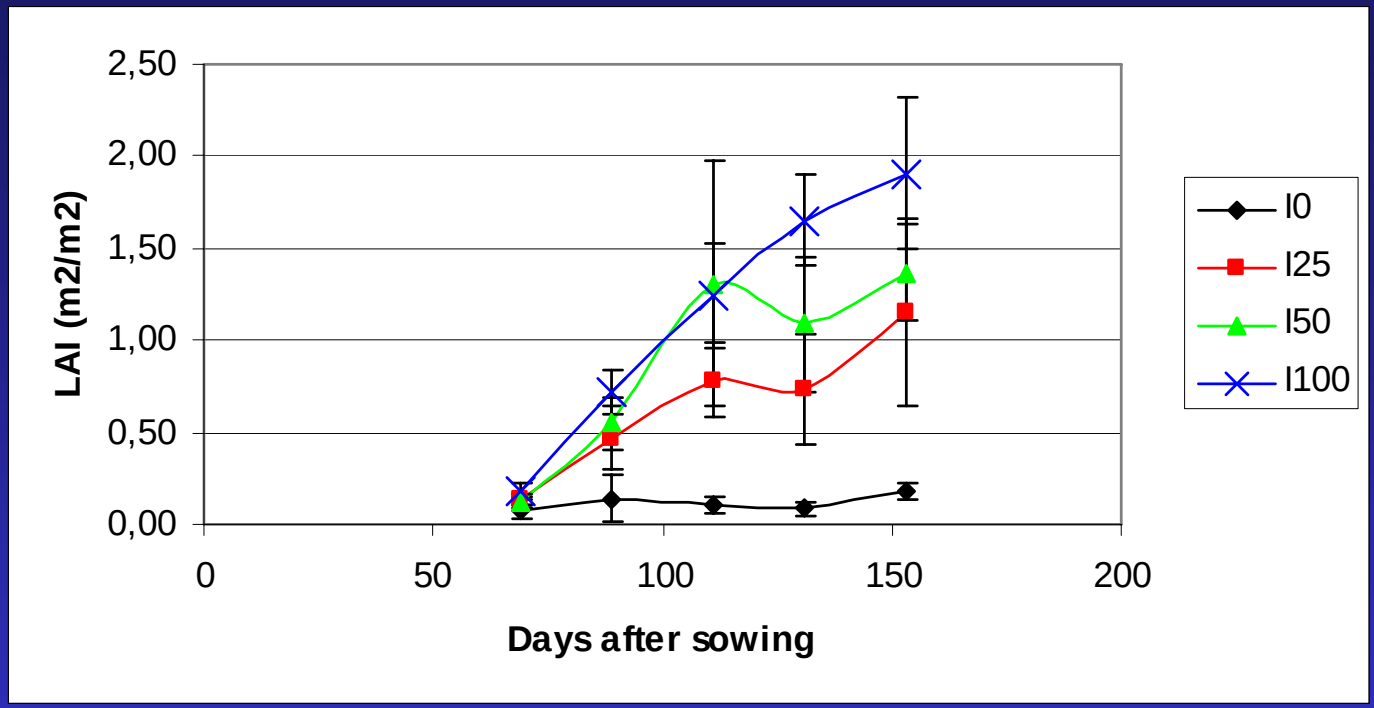
Significant differences among irrigation levels, I0 is much lower

Diameter of the crop



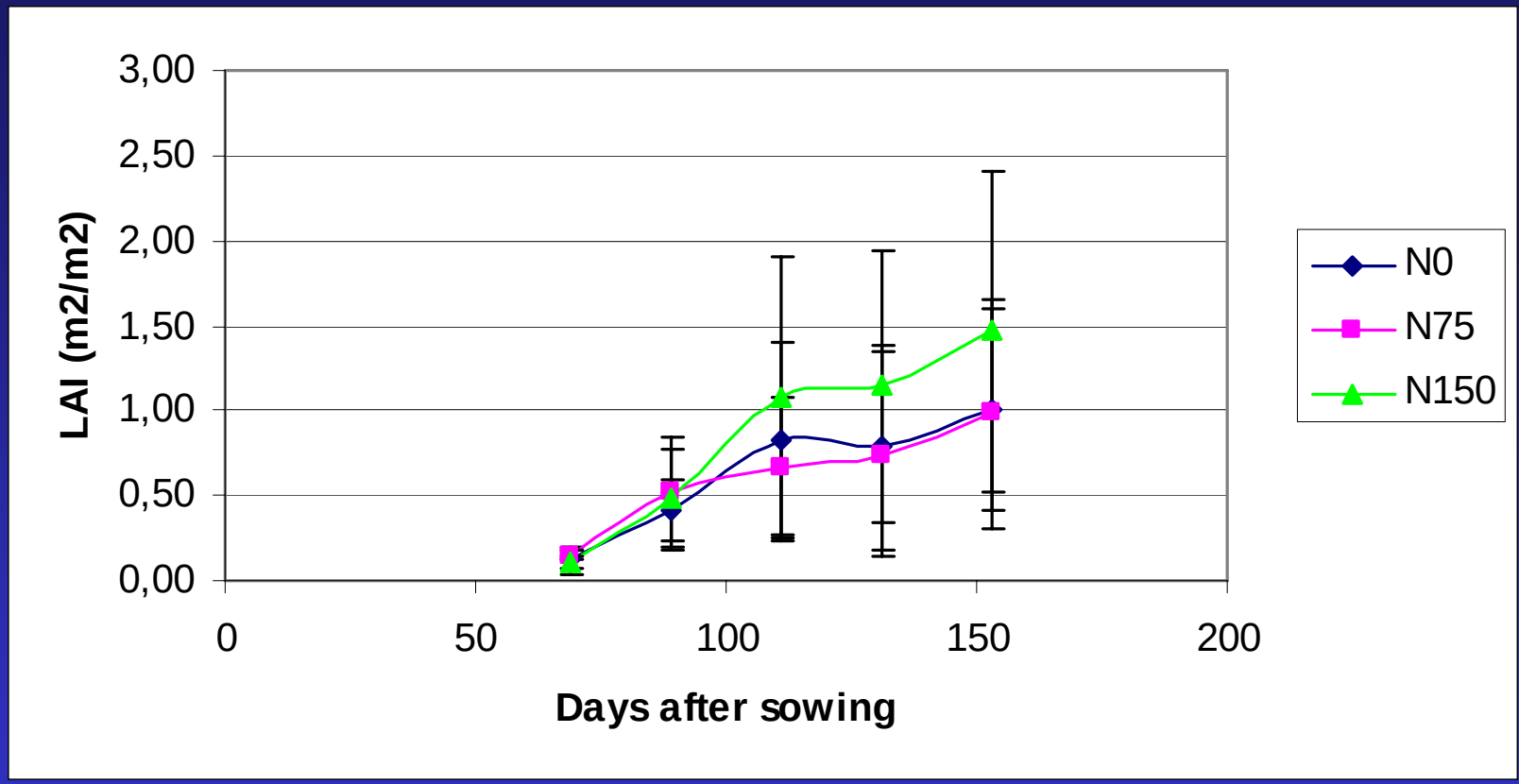
No differences among N-fertilization levels

LAI



Significant differences among irrigation levels, I0 is much lower

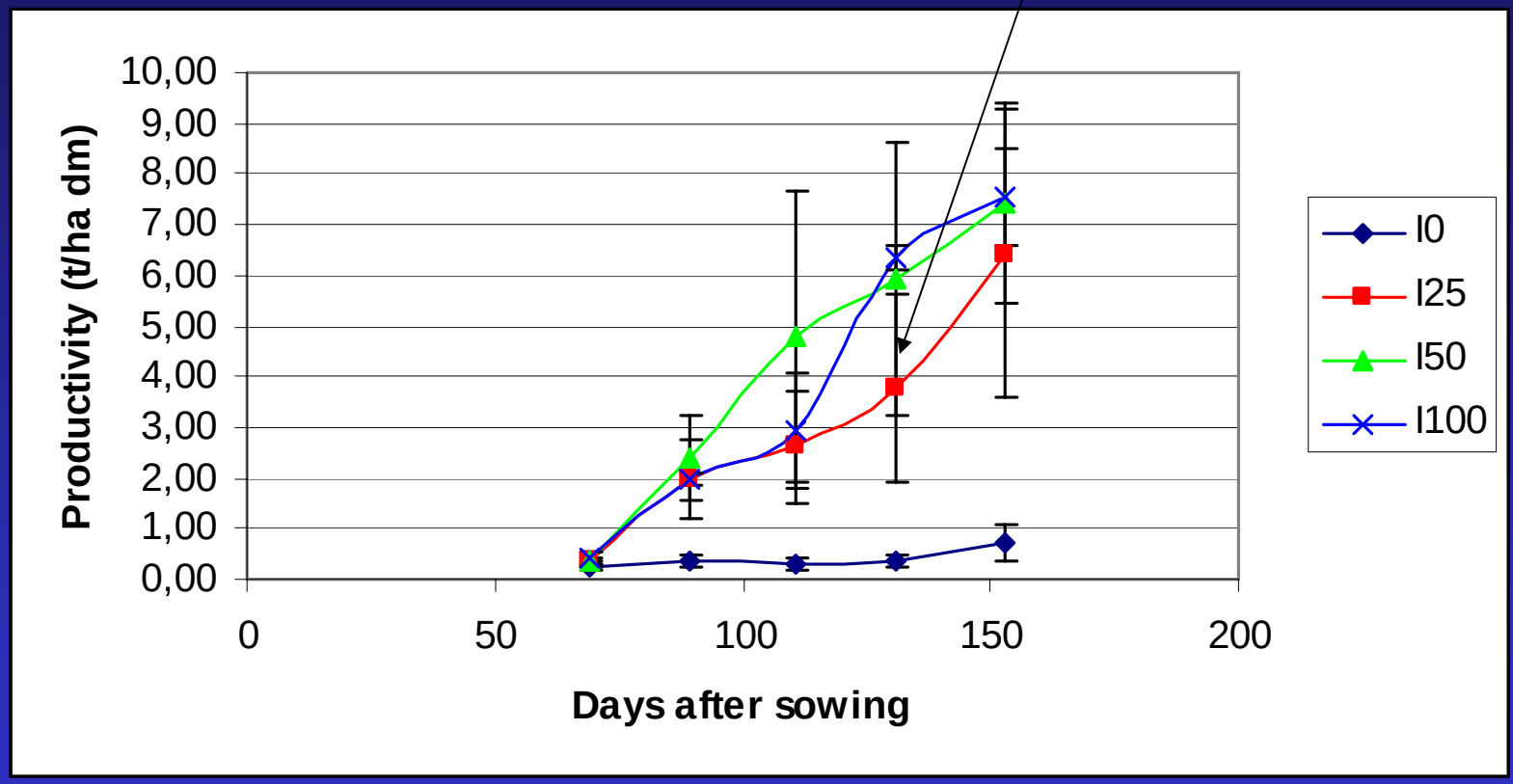
LAI



No differences among N-fertilization levels, althought N150 presents higher LAI

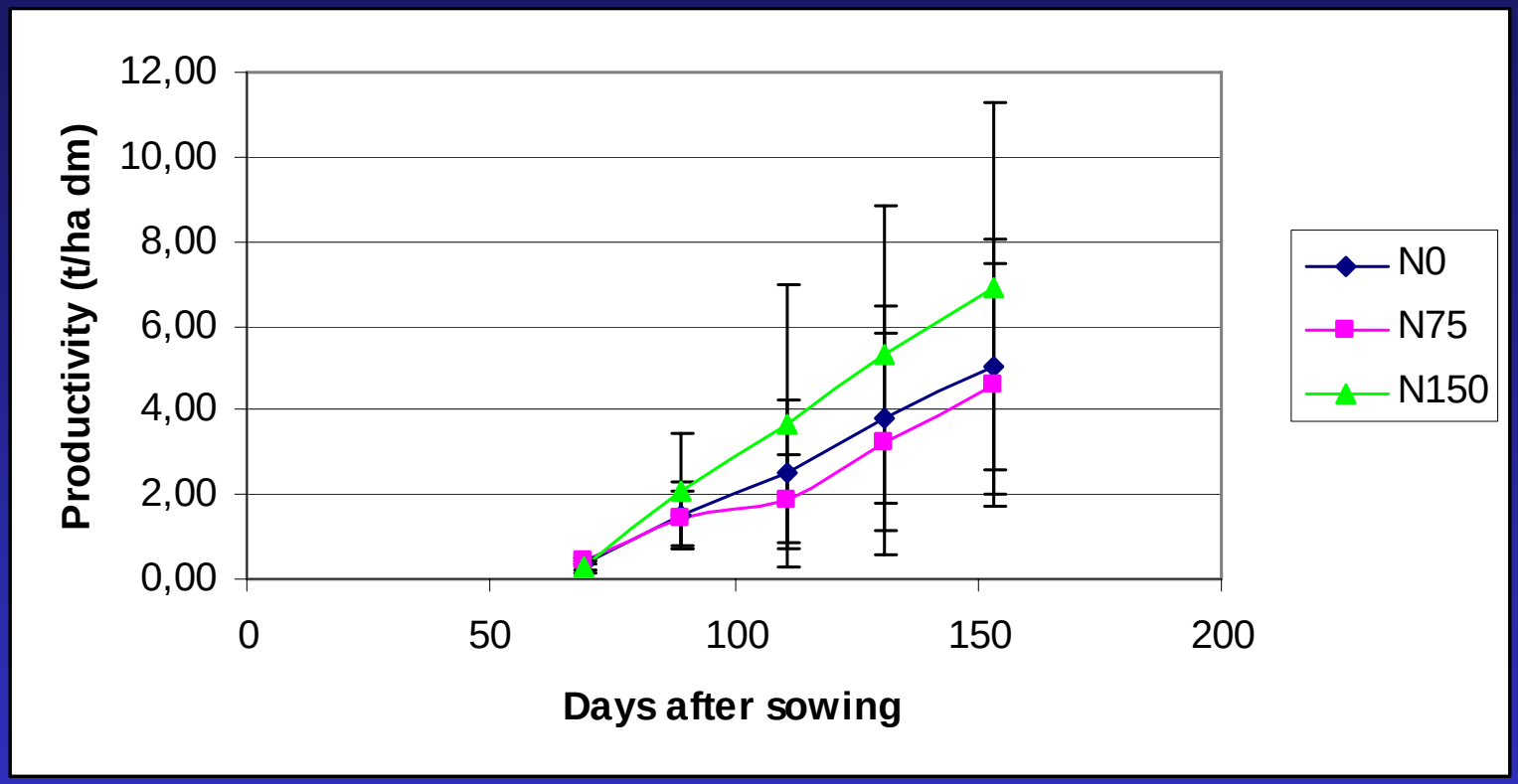
Productivity

After rainfall (4th October



Significant differences among irrigation levels, I0 is much lower

Productivity



No differences among N-fertilization levels, althought N150 presents higher results