

■ Nano-Gro® in tests on greenhouse tomato (registration test, IW Skierniewice 2008)

I. Aim of the test:

Assessment of the effectiveness of the organic stimulator **Nano-Gro®** **on the growth and development of plants and its effect on the yield** of tomato cultivated in an extended cycle on Grodan - Master mineral wool in a closed system without nutrient recirculation.

Study method and procedure:

- warmhouse equipped with a microclimate control computer system,
- mineral wool cultivation mats were prepared and further cultivation was carried out in accordance with the recommended technology,
- immediately following the planting of seedlings, regular fertigation was started, suited to the climatic conditions and the plant growth phase,
- during the cultivation process the nutrient composition was dosed on the basis of typical greenhouse fertilisers, one-, two- or multi-component.

The following were examined in the study:

1. **Tomato seeds and plants, treated** with the **Nano-Gro®** stimulator.
2. **Tomato seeds and plants, not treated** with the **Nano-Gro®** stimulator (control).

Important dates of agrotechnical procedures

- | | |
|-------------------------------------|-----------------|
| – seed treatment/soaking: | 04 March 2008 |
| – sowing: | 04 March 2008 |
| – planting out: | 17 March 2008 |
| – placing on mats: | 24 April 2008 |
| – watering with Nano-Gro® solution: | 24 April 2008 |
| – plants' topping: | 19 August 2008 |
| – end of cultivation: | 22 October 2008 |

Fruit were harvested twice a week.

Nano-Gro® way of usage:

- **1 pellet of Nano-Gro®** were dissolved completely in **1 l of water**,
- before sowing, tomato **seeds** were **soaked in Nano-Gro® solution for 20-30 seconds**, then dried,
- tomato seedlings, **after planted** in the permanent place, were **watered with Nano-Gro® solution** at the dose of **30 ml/1 plant**,
- watering was repeated at the phase of blossoming of the third raceme.

Observations and analysis of the following were conducted during the test:

During seedlings production:

- seed germinating quality,
- seedling growth,
- seedling quality (plant weight, leaf diameter, area, plant height).

During vegetation period:

- effect of Nano-Gro® on the development of root system,
- effect on wholesomeness of plants,
- effect on number of flowers, racemes and fruit per raceme,
- visual assessment of leaf colour,
- assessment of fruit average size,
- effect on nutrition of tomato plants,
- effect on amount of early, commercial and total yield.

II. Results.

1. Plants' development during vegetation.

- **More flowers** (by **13%**) and **fruit** (by **4%**) on average were produced by **plants treated with Nano-Gro®**,
- **well developed root system**, roots strongly attached to the substrate, numerous roots in the entire mat and on the side walls; **white roots**,
- **No summer growth slow-down**, caused by high temperatures, was observed in the plants **treated with Nano-Gro®**.

2. Yield.

- **significantly higher commercial yield, ripe fruit and the total yield** obtained after the application of **Nano-Gro®**. The **increase of the commercial yield** was equal to **17,6%** (nearly **8 kg/m²**).

Plot	Fruit yield, kg/m ²							
	early	change %	commercial	change %	ripe fruit	change %	total	change %
Nano-Gro®	16,03	+17,0%	52,58	+17,6%	52,95	+16,7%	53,23	+16,4%
Control group	14,85		44,73		45,37		45,73	

- **a high percentage of choice I_A in the total yield (17% in comparison to control group)**, low percentage of choice I_B and out of choice fruit,
- tomato plants treated with **Nano-Gro®** during the period of intense yielding showed **better vitality** and **better growth** than the control plants.

3. Nutrition of tomato plants.

- **appropriate**; slightly **higher nitrogen and phosphorus content** in plants treated with **Nano-Gro®** than in the control group,
- tendency to **increase N (by 14%), P (by 60%) and K (by 5%)** in fruit from the **Nano-Gro®** plot,
- good quality and plump fruit from the cultivation of tomato with **Nano-Gro®**,
- **better colour**, both **internal** and **external** of tomato fruit from the plants treated with **Nano-Gro®** throughout the whole yielding period,
- **increase of hardness and firmness of fruit from plants treated with Nano-Gro®**.

III. Conclusions

The experiment provided grounds for the conclusion that **application of Nano-Gro® growth stimulator positively affects the growth, development and especially yielding of tomato in soilless cultivation.**

The results obtained in it show that application of Nano-Gro® in soilless cultivation of tomato is justified.