

MANAGEMENT OF ORGANIC RESIDUES AS POOLS OF NITROGEN IN TOMATO CROP (“Ramellet”), A VARIETY OWN OF MALLORCA

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INTRODUCTION

Growing “ramellet” tomatoes (bunch tomato) is very traditional in Majorca. This variety is characterized by its resistance to drought and its long post-harvest conservation period. Some studies conducted on this type of tomato aim at finding alternative management practices to improve both production and quality. Since it is also a major crop on the island of Majorca, it is intended that tomato quality and production go hand in hand with minimum environmental impact.

MATERIALS AND METHODOLOGY

Two type of compost were used:

1. One compost of sewage sludge (**COMP**)
2. Another compost consist in a mixture of sewage sludge, swine slurry and manure. (**COMP+PUR**)

Doses used.

Three different doses of the two compost types were used. Namely, 3.500, 7.000, and 10.000 Kg/ha. (table 1).

The soil amended with compost compared to a slow-release NPK fertilizer (14.7.17) plus potassium sulphate (**MINERAL FERT**).

| TREATMENTS | DOSE (Kg/ha) |
|--------------|-----------------|
| D1 COMP | 3.500 |
| D2 COMP | 7.000 |
| D3 COMP | 10.000 |
| D1 COMP+PUR | 3.500 |
| D2 COMP+PUR | 7.000 |
| D3 COMP+PUR | 10.000 |
| MINERAL FERT | 600 |

Table 1. Treatments

Soil and fruit sampling and analytical

40 and 100 days after the plantation of the tomato plants, as well as at the time of harvest.

Soil chemical parameters associated with fertility were measured at each stage, along with ammonium and nitrate levels. Three developmental stages were studied, where the following fruit parameters were analyzed: fruit weight, fruit number per surface area, hardness, pH, and acidity.

The soil characterization was carried out according to the Spanish soil methodology (MAPA, 1994).

Acknowledgement

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OBJETIVE

This study focuses on comparing the effect of a slow-release nitrogen fertilizer, and two different types of compost on bunch tomato (ramellet) farming. So The aims were

- To assess the best farming practices involving the aforementioned compost types
- The effect of the type of fertilization on production, quality, and fruit preservation,
- Finally to study the influence on chemical characteristics of the soil..

RESULTS

➤ Generally speaking, no significant differences in soil characteristics were found between soils treated with the two different kinds of compost. The 40-day measurement showed a significant increase in electrical conductivity at the highest dose of both types of compost (Table 2).

| TREATMENT | pH | E. C. 25° (dS/m) | % N | P (mg/Kg) | K (mg/Kg) | M.O. (%) |
|--------------|------|------------------------|------|--------------|--------------|-------------|
| D1 COMP | 8,48 | 0,19 | 0,12 | 8,48 | 452,25 | 1,45 |
| D2 COMP | 8,90 | 0,17 | 0,11 | 8,90 | 421,67 | 1,29 |
| D3 COMP | 8,40 | 0,46 | 0,13 | 8,40 | 443,50 | 1,48 |
| D1 COMP+PUR | 8,48 | 0,19 | 0,12 | 8,48 | 461,25 | 1,36 |
| D2 COMP+PUR | 8,45 | 0,18 | 0,13 | 8,45 | 439,00 | 1,37 |
| D3 COMP+PUR | 8,44 | 0,44 | 0,12 | 8,44 | 462,25 | 1,45 |
| MINERAL FERT | 8,14 | 2,24 | 0,12 | 8,14 | 550,50 | 1,26 |

Table 2 Soil characteristics after 40 days of growing of tomato plant with different fertilization

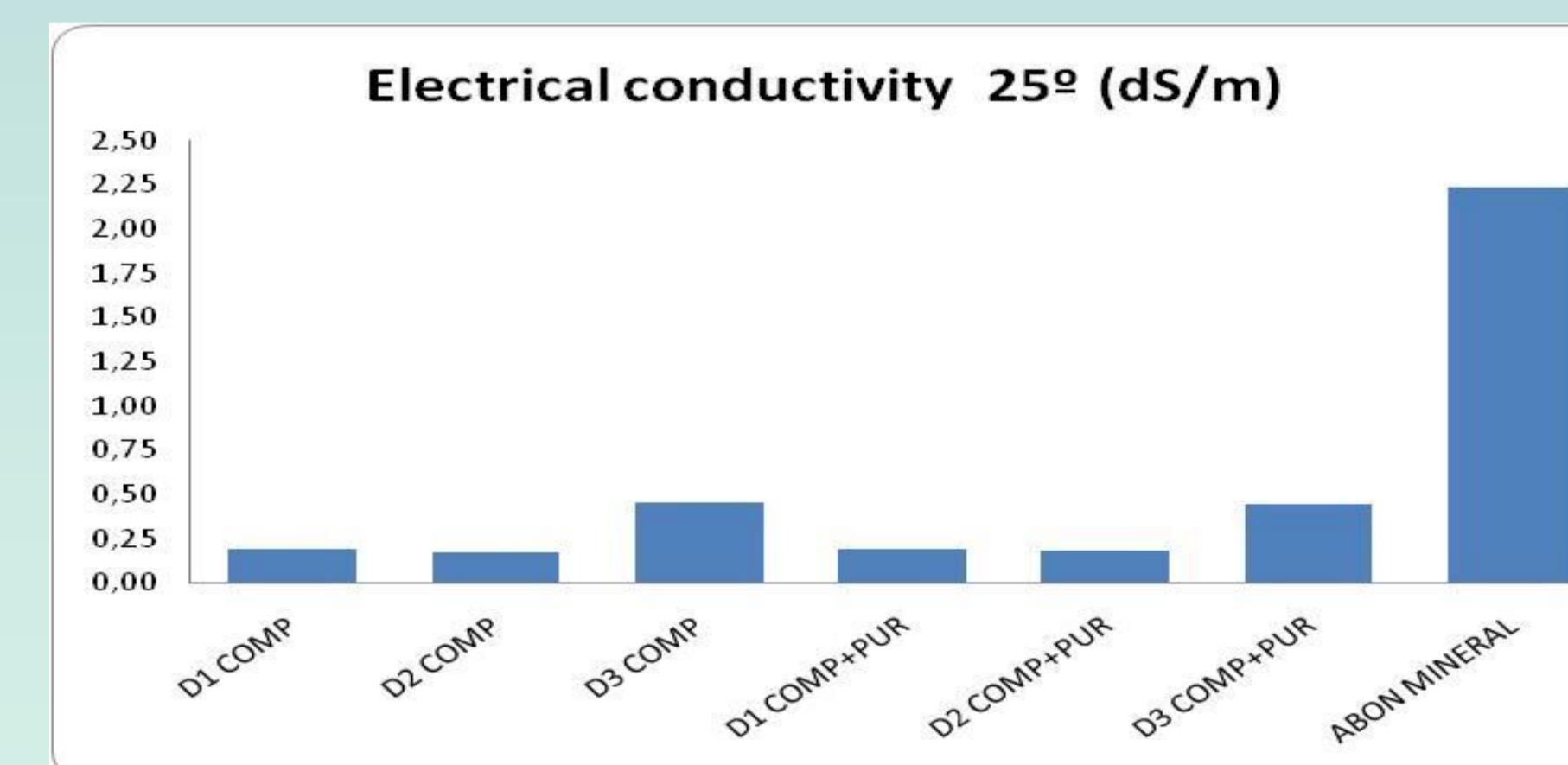


Figure 1. E.C. After 40 days of crop

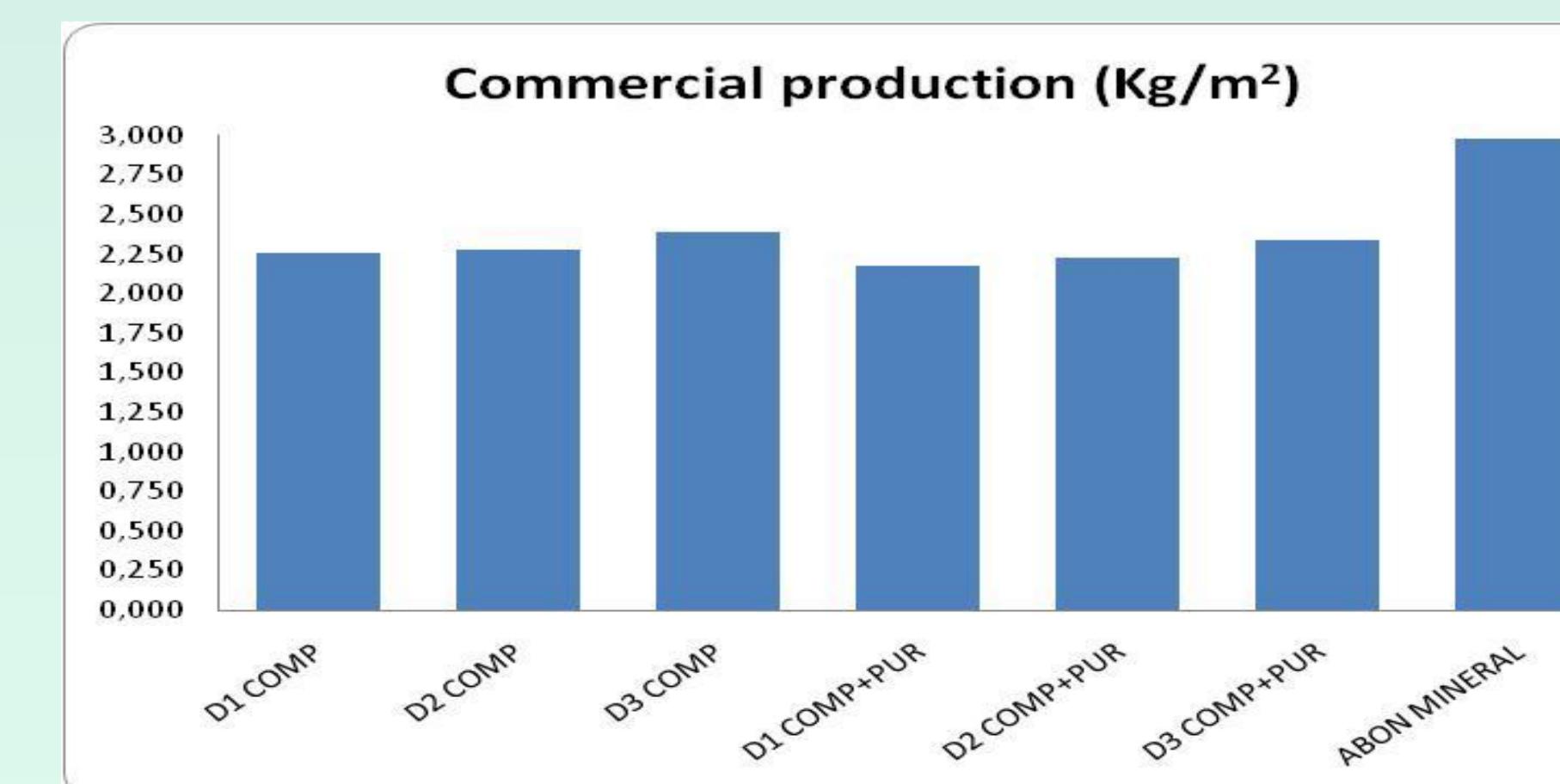


Figure 2. Commercial production

➤ However, the most significant and worth-high lighting increase was that of electrical conductivity in soils treated with slow-release mineral fertilizer, which went up to 2.24 dS/m.



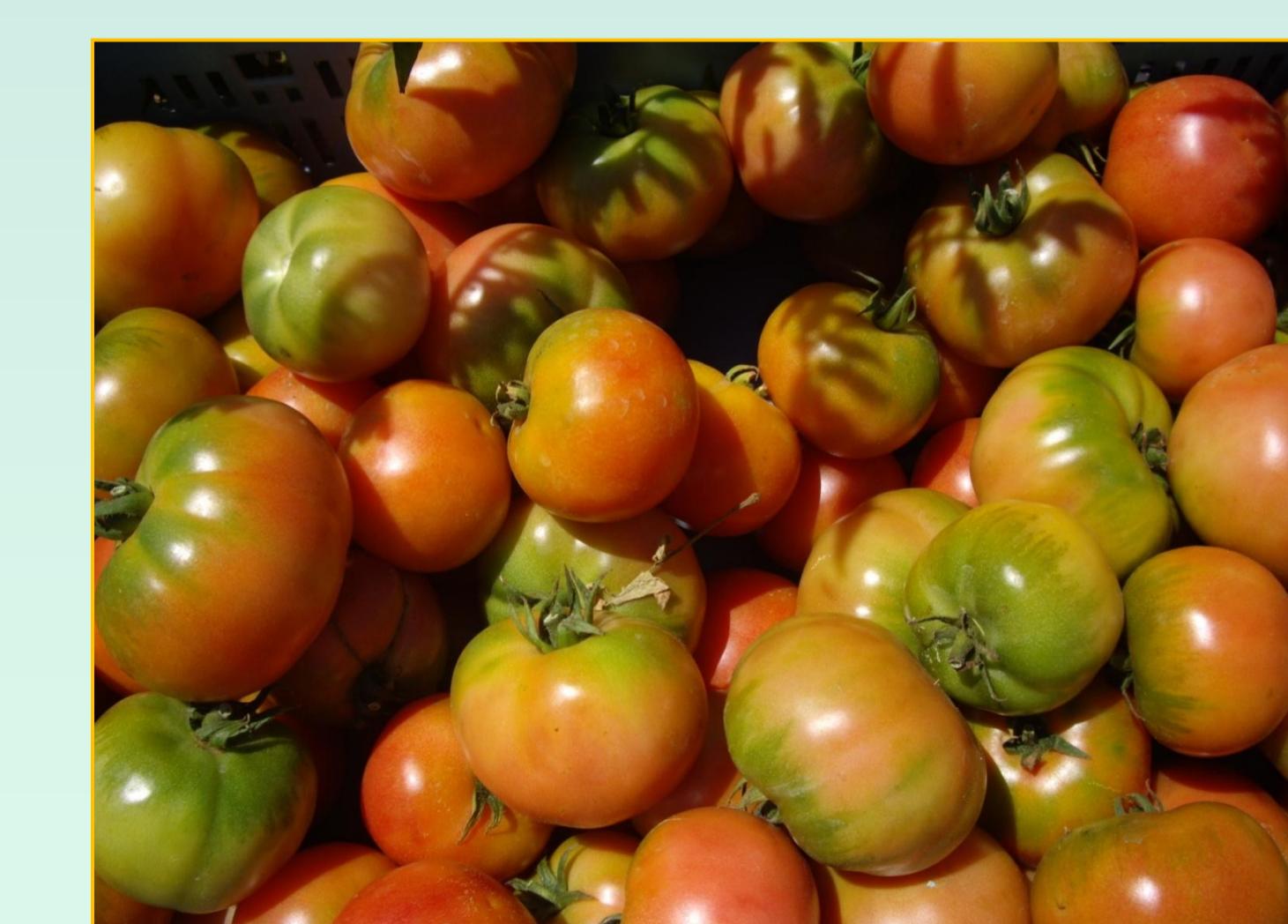
Compost application



After 40 days of crop



After 70 days of crop



“Ramellet” tomato

Table 3. Results of production and fruit quality parameters

| TREATMENTS | Average weight (g) | Prod. (kg/m²) | Unit./m² | Hardness | °Brix | Ph |
|--------------|--------------------|------------------|----------|----------|--------|------|
| D1 COMP | 90,4 | a | 2,255 | b | 495,00 | 5,40 |
| D2 COMP | 87,4 | ab | 2,277 | b | 522,92 | 5,53 |
| D3 COMP | 86,1 | ab | 2,386 | b | 617,78 | 5,63 |
| D1 COMP+PUR | 92,1 | a | 2,181 | b | 515,50 | 4,11 |
| D2 COMP+PUR | 82,6 | bc | 2,228 | b | 502,92 | 5,60 |
| D3 COMP+PUR | 87,7 | ab | 2,341 | b | 400,33 | 5,54 |
| MINERAL FERT | 77,6 | c | 2,976 | a | 594,17 | 4,23 |

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|------------|--------------------|------------------|----------|----------|-------|----|
| D1 COMP | 90,4 | a | 2,2 | | | |