# Comparison study of vines rope and bracket pot systems on melon ginsen and ougan makuwauri

**A Wahyudi[1*], R Putri[1], MF Sari[1], and W Rahmawati[1]**

[1]Politeknik Negeri Lampung, Bandar Lampung, Indonesia

*Corresponding author: anung@polinela.ac.id

**Abstract.** Melon production in Indonesia is increasing along with the increasing population and also affects to the seeds as planting material. This research was conducted to determine the effect of the planting system on the growth and productivity of melon seeds and to obtain an oriental melon line with striped fruit and a sweet taste. The materials used in this study were melon seeds from a cross between ginsen makuwauri (GM) and ougan makuwauri (OM) first generation (F1). The research design used was a Randomized Block Design (RCBD) with a single factor, namely the cropping system. Each greenhouse has a different treatment, namely, at GH 1 (vines) and GH 2 (bracket pot), there are six replications to get 12 experimental units. Observational data were analyzed for variance and the Least Significant Difference (LSD) test at 5% and 1% levels. Observations were made on quantitative and qualitative characters. The environmental quantitative observation variables were temperature and humidity, while in melon plants, namely tendril length, number of leaves, stem diameter, leaf width, leaf length, petiole length, flowering age, harvest age, fruit weight, total dissolved solids, fruit length, a width of fruit, thickness of fruit flesh, weight of seeds per fruit, and number of seeds per fruit. Qualitative observation variables were leaf shape, leaf color, leaf lobe shape, petiole length, petiole color, flower sex, fruit shape, dominant fruit skin color, secondary skin color pattern, and seed shape. Based on statistical analysis, the results showed that the environment and the bracket pot planting system in GH 2 had a very significant effect on the length of the plant tendrils, while the environment and the planting of the vines system in GH 1 had a significant effect on fruit width and seed weight.

## 1. Introduction

The need for melons in the country continues to increase every year in line with the diet of the population that requires fresh fruit [1]. According to the [2] melon production in Lampung province in the last three years has increased, namely in 2018, 2019, and 2020, respectively, 479 tons, 494 tons, and 622 tons, with a harvested area of 99 hectares. Some of the most widely grown and marketed melon varieties are the Sky Rocket Melon, Rock Melon, and Golden Melon varieties. These varieties have their characteristics such as fruit shape, fruit color, taste, level of sweetness, skin color, and size. Character differences depend on the variety grown, and the environment, and are influenced by cultivation techniques [3]. Melon production in Lampung province has also increased, in line with the increasing demand for seeds. One of the obstacles in the production of melon seeds is cultivation techniques. Until now, melon varieties circulating in Indonesia still rely on imports from Taiwan, Thailand, and Japan. The availability of these seeds does not guarantee Indonesia's national needs. This causes the production of melon seeds in the country must be of high quality and produce quality seeds. The varieties produced must be superior and the seeds must be of high quality so that their existence is expected to replace imported seeds [4]. Seed production in a greenhouse aims to facilitate the control of some environmental factors that affect plant growth, these environmental factors include air temperature, sunlight, air humidity, wind speed, and nutrients in controlling pests and diseases are easy to control because these environmental factors controlled by planting in a greenhouse [5]. The objectives of this study were: (1) To determine the effect of the planting system between GH 1 (vines growing system) and GH 2 (bracket pot planting system) on seed growth and productivity. (2) Obtaining an oriental melon fruit strain with a striped fruit character and a sweet taste.

## 2. Method

This research was conducted in June-September 2022 at the Seed Teaching Farm (STEFA) area of the Politeknik Negeri Lampung (Polinela). This study used a Randomized Block Design (RCBD), with a single factor, namely the cropping system. The first treatment was GH 1 (vines ropes planting system) and the second treatment was GH 2 (bracket pot planting system). There were six replications, three plant samples were taken for each replication, thus obtaining 12 experimental units. The data obtained were analyzed using the 5% F-test, and then continued using the LSD-test at the 5% and 1% levels.

## 3. Result and Discussion

The results showed that the environmental observation variables were temperature and humidity. The temperature observation variable has a very significant effect between treatments, the humidity observation has no effect between treatments. The recapitulation of environmental observations is presented in Table 1. The recapitulation of quantitative observations is presented in Table 2.

**Table 1.** Recapitulation of environmental observations.

| Variabels | F-test (planting system) | | Coefficient of Diversity (%) |
|---|---|---|---|
| Temperature | 83.83 | ** | 3.01 |
| Humidity | 0.26 | ns | 3.46 |

**Notes** : **): Very significant different; ns): not significant differents.

**Table 2.** Recapitulation of quantitative observations.

| Variables | F-test (planting system) | | Coefficient of Diversity (%) |
|---|---|---|---|
| Tendril length | 224.32 | ** | 4.51 |
| The number of leaf | 2.85 | ns | 3.38 |
| Stem diameter | 1.12 | ns | 12.51 |
| Leaf width | 0.06 | ns | 3.80 |
| Leaf length | 0.25 | ns | 5.65 |
| Petiole length | 5.33 | ns | 10.30 |
| Fruit weight | 1.41 | ns | 21.92 |
| Sugar content | 0.14 | ns | 13.50 |
| Fruit length | 4.03 | ns | 6.19 |
| Fruit width | 7.68 | * | 2.94 |
| Fruit thick flesh | 0.26 | ns | 14.12 |
| Seeds weight | 8.89 | * | 10.62 |
| The number of seeds | 4.08 | ns | 12.35 |

**Notes** : *): Significant different; **): very significant different; ns): not significant differents.

The environmental temperature obtained an average yield of GH 1 (vines ropes system) of 36.33 °C and GH 2 (bracket pot system) of 42.62 °C. The daily environmental temperature showed significantly differents. An average temperature for melon plant growth is 18-37 °C, while melon plants will grow optimally at 22-37 °C. An Analysis of F-test and LSD test for 5% and 1% levels of environmental temperature observations are presented in Table 1 and Table 3. Too high a temperature causes high transpiration and then the respiration increases. The decomposition of photosynthesis to produce energy decreases, the activity of enzymes in the photosynthetic process is disrupted so that the photosynthate yield decreases. Air temperatures that are too high can affect nutrient uptake, causing plants to wither, as a result the plants will die [6].

The results of the statistical analysis showed that the treatment of different planting systems on the length of the tendrils of melon plants was different between the first treatment (vine ropes) which was significantly different from the second treatment (bracket pot). This is in line with the statement that between treatments shows that the length of the tendrils of different melon plants can be caused by environmental factors such as rainfall, temperature, and humidity [7]. The tendril length data is presented in Table 2 and Table 4.

**Table 3.** Environmental data of temperature.

| Variabel | Temperature (°C) |
|---|---|
| GH 1 (Vines ropes) | 36.33 a |
| GH 2 (Bracket Pot) | 42.62 b |
| LSD test | 1.76 |
| Coef. diversity (%) | 3.01 |

**Notes**: Numbers followed by unequal letters in the same column are significantly different according to the LSD test at the 5% and 1% levels. GH: Grennhouse; LSD: Least Significant Differents.

**Table 4.** Quantitative data of tendril length.

| Variabel | Tendril lenght (cm) |
|---|---|
| GH 1 (Vines ropes) | 109.88 a |
| GH 2 (Bracket Pot) | 163.11 b |
| LSD test | 9.14 |
| Coef. diversity (%) | 4.51 |

**Notes**: Numbers followed by unequal letters in the same column are significantly different according to the LSD test at the 5% and 1% levels. GH: Grennhouse; LSD: Least Significant Differents.

**Table 5.** Quantitative data of fruit width.

| Variabel | Fruit width (cm) |
|---|---|
| GH 1 (Vines ropes) | 8.19 b |
| GH 2 (Bracket Pot) | 7.81 a |
| LSD test | 0.35 |
| Coef. diversity (%) | 2.81 |

**Notes**: Numbers followed by unequal letters in the same column are significantly different according to the LSD test at the 5% and 1% levels. GH: Grennhouse; LSD: Least Significant Differents.

The results of the statistical analysis showed that the treatment of different planting systems on the fruit width and seeds weight of melon plants was different between the first treatment (vine ropes) which was significantly different from the second treatment (bracket pot). The fruit width and seeds weight data is presented in Table 5 and Table 6. The vine ropes system is higher result in fruit width and seeds weight compared bracket pot system.

**Table 6.** Quantitative data of seeds weight.

| Variabel | Seeds weight (gram) |
|---|---|
| GH 1 (Vines ropes) | 6.85 b |
| GH 2 (Bracket Pot) | 5.70 a |
| LSD test | 0.99 |
| Coef. diversity (%) | 10.62 |

**Notes**: Numbers followed by unequal letters in the same column are significantly different according to the LSD test at the 5% and 1% levels. GH: Grennhouse; LSD: Least Significant Differents.

## 4. Conclusion

The environment and the bracket pot planting system in GH 2 (bracket pot planting system) had a very significant differents on the length of the tendrill (163.11 cm) while in GH 1 (vine ropes planting system) it was (109.88 cm). The environment and the vines planting system and seed weight in GH 1 had a significant differents on the fruit width of GH 1 which was higher (8.19 cm), while in GH 2 it was (7.81 cm) and the weight of GH 1 seeds was higher (6.85 g) while that of GH 2 was (5.70 g). Variables observed for the number of leaves, stem diameter, leaf width, leaf length, petiole length, fruit weight, sugar content, fruit length, fruit width, flesh thickness, and number of seeds had not significant differents between treatments.

## 5. Acknowledgement

This study was supported by DRPM from The Minister of Education, Culture, Research and Technology (Directorate General of Vocational Study), the contract number: 082/SPK/D4/PPK/.01.APTV/VI/2022 and contract number: 407.2/PL15.8/PT/2022.

## References

[1] Rasilatu F, Nikmah MF, and Wawan P 2016 Production response of two melon varieties (*Cucumis melo* **L**.) to shoot pruning *Journal of Agroteknotropika* **5**(3) 321-326 [Indonesian]

[2] Central Bureau of Statistics 2020 Statistics of Indonesian Seasonal Vegetables and Fruits [Accessed July 13th 2022] [https://www.bps.go.id/]

[3] Shintarika F and Sulis NW 2022 The effect of $KNO_3$ fertilizer doses on sugar levels in three melon varieties at BPP Lampung *Agrosaint Journal* **6**(1)1-8 [Indonesian]

[4] Zulfikri, Erlita H, and Muhammad N 2015 Phenotypic appearance of genetic parameters of yield characters and yield components of melon (*Cucumis melo* **L**.) *Floratek Journal* **10**(2) 1-11 [Indonesian]

[5] Ristian U, Ikhwan R, and Kartika S 2020 Smart greenhouse monitoring system on limited land based on Internet of Things (IoT) *Journal of Informatics Education and Research* **8**(1) 87-94. [Indonesian]

[6] Sekar YK, Yohanes CG, and Agus K 2014 Effect of the best copper concentration on the growth and production of two varieties of melon (*Cucumis melo* **L**.) in a solid media hydroponic system *Journal of Tropical Agrotek* **2**(3) 341-346 [Indonesian]

[7] Sangadji Z, Nurul F, and Akhmad A 2021 Effect of bioboost fertilizer application by various treatments on growth and yield of melon (*Cucumis melo* **L**.) *Journal of AGROLOGY* **10**(2) 88-95. [Indonesian]