

the lower the efficiency. To increase the efficiency can be achieved by increasing the amount of dry matter or yield for each unit of water volume provided (Wiroatmojo, 1985).

IV. CONCLUSIONS

The amount of rainfall potential that can be harvested from the greenhouse roof is 202.5 m³ per year, this value is sufficient to be used as an fertigation water source especially in the dry season. The average yield of red oval tomato plants using autopot the lowest yield is 0.731 kg / plant and the highest yield of 1,648 kg. The value of water use efficiency of red oval using autopot is 10.35 kg/m³.

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REFERENCES

- [1] S. Dwiratna, N. Bafdal, C. Asdak, and N. Carsono, "Study of Runoff Farming System to Improve Dryland Cropping Index in Indonesia," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 8, no. 2, pp. 390–396, 2018.
- [2] N. Bafdal, S. Dwiratna, D. R. Kendarto, and E. Suryadi, "Rainwater Harvesting As a Technological Innovation to Supplying Crop Nutrition through Fertigation," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 7, no. 5, pp. 1670–1675, 2017.
- [3] Nurpilihan, "Rainfall Harvesting as Resources of Self Watering Fertigation System with Various Growing Medias," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 6, no. 5, pp. 787–792, 2016.
- [4] Nurpilihan, S. Dwiratna, and D. R. Kendarto, "Impact of Water Use on Paprika (*Capsicum annum*) by Using Fertigation and Autopot System Combined with Numerous Growing Media," *Asian J. Plant Sci.*, vol. 16, no. 3, pp. 149–159, 2017.
- [5] B. Nurpilihan and S. Dwiratna, "Water Harvesting System as an Alternative Appropriate Technology to Supply Irrigation on Red Oval Cherry Tomato Production," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 8, no. 2, pp. 561–566, 2018.
- [6] Nurpilihan, S. Dwiratna, and D. R. Kendarto, "Runoff Management Technology for Integrated Dry Land Agriculture in Jatiningor Research Center West Java Indonesia," *Egypt. J. Desert Res.*, vol. 65, pp. 1–11, 2015.
- [7] S. Kumar, T. Ramilan, C. A. Ramarao, C. S. Rao, and A. Whitbread, "Farm-level rainwater harvesting across different agro-climatic regions of India: Assessing performance and its determinants," *Agric. Water Manag.*, vol. 176, pp. 55–66, 2016.
- [8] M. Napoli, S. Cecchi, S. Orlandini, and C. A. Zanchi, "Determining potential rainwater harvesting sites using a continuous runoff potential accounting procedure and GIS techniques in central Italy," *Agric. Water Manag.*, vol. 141, pp. 55–65, 2014.
- [9] N. Rostad, R. Foti, and F. A. Montalto, "Harvesting rooftop runoff to flush toilets: Concluding four major U.S. cities," *Resour. Conserv. Recycl.*, vol. 108, 2016.
- [10] K. J. An, Y. F. Lam, S. Hao, T. E. Morakinyo, and H. Furumai, "Multi-purpose rainwater harvesting for water resource recovery and the cooling effect," *Water Res.*, vol. 86, 2015.
- [11] W. H. Mahmoud, N. A. Elagib, H. Gaese, and J. Heinrich, "Rainfall conditions and rainwater harvesting potential in the urban area of Khartoum," *Resour. Conserv. Recycl.*, vol. 91, pp. 89–99, 2014.
- [12] P. A. Patel, M. D. Desai, and J. A. Desai, "Rooftop Rainwater Harvesting, Conservation and Management Strategies for Urban and Rural Sectors," in *India Water Week 2012-Waetr, Energy and Food Security: Call for Solutions*, 2012, no. April, pp. 10–14.
- [13] P. J. Kramer and J. S. Boyer, *Water Relations of Plants and Soils*. California: Academic Press, 1995.
- [14] M. Treeby, S. Falivene, and M. Skewes, "Fertigation: delivering fertiliser in the irrigation water," *Primefact*, no. DECEMBER 2006, p. 4, 2011.
- [15] M. Kabirigi *et al.*, "Fertigation for Environmentally Friendly Fertilizers Application: Constraints and Opportunities for Its Application in Developing Countries," pp. 292–301, 2017.
- [16] R. A. Jat, S. P. Wani, K. L. Sahrawat, P. Singh, and B. Dhaka, "Fertigation in Vegetable Crops for Higher Productivity and Resource Use Efficiency," *Indian J. Fertil.*, vol. 7, no. 3, pp. 22–37, 2011.
- [17] I. Papadopoulos, C. Metochis, and N. Seraphides, "Fertigation recipes for selected crops in the Mediterranean region," Cyprus, 2011.
- [18] L. Incrocci, D. Massa, and A. Pardossi, "New Trends in the Fertigation Management of Irrigated Vegetable Crops," *Horticulturae*, vol. 3, no. 37, pp. 1–20, 2017.
- [19] J. Fah, *Hydroponics Made Easy: A Useful Guide for Novice and Intermediate Users of Hydroponics*. Bayswater, Vic: Agromatic Corporation Pty Ltd, 1996.
- [20] B. Lancaster, *Rainwater Harvesting for Drylands and Beyond, Volume 2: Water-Harvesting Earthworks*, Second Pri. Tucson, Arizona: Rainsources Press, 2010.
- [21] A. Olley, "Greenhouse Tomato Production in Cocopeat Turkey," *Andrew Olley Consult.*, pp. 1–57, 2009.
- [22] M. Suzuki *et al.*, "Effects of relative humidity and nutrient supply on growth and nutrient uptake in greenhouse tomato production," *Sci. Hortic. (Amsterdam)*, vol. 187, pp. 44–49, 2015.
- [23] S. E. Wortman, "Crop physiological response to nutrient solution electrical conductivity and pH in an ebb-and-flow hydroponic system," *Sci. Hortic. (Amsterdam)*, vol. 194, pp. 34–42, 2015.