

**IMPROVING YIELD OF OFF-SEASON TOMATO USING DIFFERENT
NUTRIENT AND PESTICIDE MANAGEMENT**

HERVIN ABELARDO LEANDRO

An undergraduate thesis manuscript presented to the faculty of the department
of Crop Science, College of Agriculture in partial fulfillment
of the requirements for the degree of

**BACHELOR OF SCIENCE IN AGRICULTURE
(Crop Science – Horticulture)**

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BIOGRAPHICAL SKETCH

Hervin A. Leandro was born on May 10,1993 in Science City of Munoz, Nueva Ecija. She is the youngest among four children of Mr. Ventura P. Leandro and Mrs. Herminia A. Leandro. She has 3 Siblings namely: Carl Eden, Irene, Imee.

She completed her elementary education in Munoz Central School in 2005 and Secondary Education in Munoz National High School 2009.Both schools are located in Science City of Munoz, Nueva Ecija.

To fulfill her dream to finish a baccalaureate degree, she continued her studies in Central Luzon State University (CLSU), where she enrolled in and pursued the degree of Bachelor of Science in Agriculture major in Crop Science and she took Horticulture as field of Specialization.

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ABSTRACT

This study on improving yield of tomato using different nutrient and pesticide management was conducted with the following objectives; (1) to determine the best nutrient and pesticide management combination in producing off-season tomatoes; and (2) to determine the cost and return analysis of producing marketable tomatoes using the different nutrient and pesticide combination during off-season. This study was laid out following Randomized Complete Block Design (RCBD) using four treatments in three replications.

The following were the significant findings of the study; T2-(FP and CP) and T3- (RP and EF) were comparable in terms of number of marketable fruit per plant, weight of marketable fruit per plant (kg), actual yield per plot (kg), computed yield per hectare. Treatment 3- (RP and EF) was significant in terms in non-marketable fruit per plant, weight of non-marketable fruit per plant (kg), days to flowering and days to fruit set.

Results of the study showed that application of T2-(FP and CP) obtained the highest yield but has the highest expenses however, T3- (RP and EF) was the best treatment for improving eating quality of tomato and enhance the plant resistance to pest and diseases. T3- (RP and EF) technology is safer for human consumption and environment because it does not use synthetic or petroleum based insecticides.

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LITERATURE CITED

- AGANON, 2004. Techno Guide for Tomato Production Technoguide for Agricultural Production and Livelihood Project. Research Extension and Training Central Luzon State University, Science City of Munoz, Nueva Ecija, 600 P.
- AGRO INFO, 2015. Climate and Soil Requirement for Tomato Cultivation. In my Agriculture Information Bank. Retrieved on March 1,2017 from <http://agriinfo.in>
- ASSMAN, S.M. 1995. Cyclic AMP as second messenger in higher plants. *Pl. Physiol.*,108: 885-889
- PHILIPPINE STATISTIC AUTHORITY,2016. Package of Technology of Different Vegetable Crops: Technology Generation and Dissemination for the Growth and Development of Vegetable Industry. DA-RFU 4A&, Diliman Quezon City. Retrieve on December 9,2015 from <http://www.psa.gov.ph>
- BUREAU OF AGRICULTURAL STATISTICS, 2007 . Crop Production Statistics. Retrieved on May 30,2017 from <http://www.bas.gov.ph>
- CHAPAGAIN B.P. and WEISMAN Z. 2004. Effect of Nutri Vant Pejak Foliar spray on plant development yield and fruit quality in green house tomatoes.
- DECOTEAU, D.R. 2002. Vegetable Crops: Prentice-Hall Inc. U.S.A
- DAGOON, J. D. 2001. School Gardening and Vegetable Production. Sampaloc , Manila , Philippines. Rex Book Store Inc. 1200 P.
- DE GUZMAN, E. B. and ENCARNACION R.L. 1998. Effect of different levels of complete fertilizer on tomato seed production. BSA Unpublished Undergraduate Thesis. Central Luzon State University, Science City of Munoz, Nueva Ecija 3120. Philippines
- EPA, I. Growing Tomato (High Valued Vegetable) Retrieved on December 9, 2015 from <http://www.mixph.com/2009/09/growing -tomatoes-high-vegetable.html>
- GAJETE, L., B.,GAJETE, J. IRABAGO and T. TIBURCIO 2004. Techno Guide for Tomato Production Technoguide for Agricultural Production and Livelihood Project. Research Extension and Training Central Luzon State University, Science City of Munoz, Nueva Ecija, P. 58-65
- HANSON J., T. CHEN, C.G. KOU, R. MORRIS, and R.T. OPENA. 2001. Suggested Cultural Practices for tomato. Retrieved on December 9, 2015 from <http://www.avrdc.org/LC/tomato/practices.html>

- HAREL, D, H. FADIDA, S. ALIK, S. GRANTZ and K. SHILO.,2013.The effect of Mean Daily Temperature and Relative Humidity on Pollen, Fruit set and Yield of tomato Grown in Commercial Protected Cultivation. Retrieved on April 20,2017 from <http://www.naandanjan.com>
- HELDT, H.W. 2005. Plant Biochemistry. Elsevier Academic Press California. USA. 45-47 pp
- IMAS, P. 2002. Management of Potassium in Organic Farming. Far Eastern Agriculture Israel. 24- 25 pp
- ISLAMI, M.S., M.M AKHTER , M.S.Q. RAHMANI, M.B BANU and KHALEQUAZZAMAN, K.M., 2008. Effect of nitrogen and number of seedlings per hill and yield component of T. aman Rice (BRRI Dhan 33). Int. J sustain Crop Production. 3(3):61-65
- KHALAFALLA M.M., G.O. MAGDOLEEN and E. AGABNA. 2010. Potassium and Calcium nitrate ameliorates the adverse effect of NaCl on in vitro induced tomato (*Lycopersicon esculentum* Mill). Int. J. C. Res., 6:68-72
- KUMAR, M., MEENA, M.L.,KUMAR, S., MAJI, S. and KUMAR, D., 2013. Effect of Nitrogen, Phosphorus and Potassium Fertilizer on the Growth, Yield and Quality of Tomato var. Azad T-6. The Asian Journal of Horticulture. 8(2):616-619
- LADORES, G. 2012. Actual production of off-season tomato. Barangay Sto Cristo, San Antonio Nueva Ecija.
- MARSCHNER H. 1995. Mineral nutrition of higher plants, Academic press, San Diego
- C. A Martinez C. A, Maestri M. and Lani E.G. 1996. In vitro salt tolerance and proline accumulation in Andean potato (*Solanum* spp.) deffering in frost resistance. PI. Sci., 116: 177-184
- MILLER E.C., C.W HADLEY, S.J SCHWARTZ, J.W ERDMAN, T.M.W BOILEAU and S.K CLINTON. 2002. Lycopene, tomato products and prostate cancer prevention. How we established causality? Pure Appl. Chem. 74(8): 1435-1441
- NAIKA S., and M. HILMI. 2005. Cultivation of Tomato. Retrieved on December 9,2015 from http://journeytoforever.org/farm_library/AD17.pdf
- NAIKA S., VAN LIDT DE JEUDE J., DE GOFFAU M., VAN DAM B. 2005. Cultivation of tomato. Production , processing and marketing in Vandam B. (ed.), Digigrafi, Wageningen, The Netherlands

- NICOLA S., G. TABALDI, FONTANA. 2009. Tomato Production systems and their application to the tropics. *Acta Horticulture* 821: 27-33
- PEYVAST G., J.A OLFATI, P.R. KHARAZI, S.K. SHAHMALEKI. 2009. Uptake of calcium Nitrate and potassium phosphate from foliar fertilizer by tomato. *J. Hort. For.*, 1(1).7-13
- SALAM M.A., M.A SIDDIQUE, M.A RAHIM, M.A RAHMAN and M.C SAHA. 2010. Quality of tomato (*Lycopersicon esculentum* Mill) As influence by boron and zinc under different level of NPK fertilizer. *Bangladesh J. Agri Res.*, 35(3):475-488
- SWIADER, M. I. and G. W. WARE. 2002. *Producing Vegetable Crops*. Fifth Edition. Interstate Publishers Inc. United State of America. 12-17 pp.