

SUMMARY

Mohammad Ali El Mujahidin.0810480056. **Relationship of air temperature at different altitudes by the potato crop productivity (*solanum tuberosum* L.), in Batu city.** Supervised by Ir. Didik Suprayogo M.Sc.,Ph.D and Dr. Ir. Damanhuri, MS.

Global climate change as the implications of global warming has resulted in instability of the atmosphere. Global warming causes climate change effect on crop productivity one of them is the increase in air temperature. Climate is one of the factors of agricultural production which is very dynamic and difficult to control. Observations of global temperature during the 19th century indicate a change in the average temperature which is an indicator of climate change. Global temperature change is indicated by the increase in the average temperature of up to 0.74°C between 1906 to 2005. Global average temperature is projected to increase about 1.8-4.0°C in the present century, and even according to other studies in the IPCC projected to range between 1.1-6.4°C. (Susandi *et al.*, 2008).

The purpose of this research are : 1) To determine the effect of temperature increase due to climate change on the productivity of potato. 2) To determine the suitable temperature for potato plantation based on altitude. The hypothesis are : 1) Global warming causing climate change, where increased temperature affect the decline of potato productivity.

This research was conducted on four location in Batu City, especially Turung Rejo village, Bumi Aji District, which refers to four altitude. Height 1 (T1) : 1300m msl (mean sea level) T2 : 1500 msl, T3 : 1670m msl, T4 : 1800m msl. With ± 65 m² land area used in each location. The observation on this research are: 1) air and soil temperature (measured at 04.00 am and 02.00 pm) or the time when earth reach its maximum and minimum temperature. 2) growth variable : Plant height (cm), trunk diameter (mm), leaves area (cm), plnt dry weight (g), CGR (Crop Growth Rate, g/day), NAR (Net Assimilation Ratio, mg/day). 3) harvest variable : tuber weight (ton/acre), tuber diameter (mm) and tuber number.

The result analysis found that growth variable affected the potato productivity, wich if more higher of growth will followed by higher productivity. This result obtained at T1 with the highest of average temperature 26,38°C, this shows that photosynthesis would be higher if the air temperature is high, but in this study it does not make T1 treatment had the highest productivity. from the air temperature with a potato that has the highest productivity is the lowest temperature in the morning with afternoon high temperatures (the highest fluctuation), where there are at T3 with minimum air temperature of 11.62° C and the maximum temperature of 24.93° C, resulting in productivity by 26, 85 tons / ha