

**MODEL MATEMATIKA PERTUMBUHAN TANAMAN TOMAT  
(*Solanum lycopersicum* L.) DENGAN PEMBERIAN PUPUK UREA DAN  
PUPUK ZA BERBASIS *POCKET FERTIGATION***

**INTISARI**

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Produksi tanaman tomat di Indonesia mengalami peningkatan dikarenakan jumlah konsumsi tomat pada sektor rumah tangga juga mengalami peningkatan. Pemupukan dilakukan untuk memenuhi unsur hara yang dibutuhkan oleh tanaman, salah satunya unsur nitrogen. Pemberian pupuk nitrogen dengan sistem fertigasi dapat memberikan nutrisi pada zona perakaran sehingga lebih efektif. Tujuan dilaksanakan penelitian ini adalah mengetahui model matematika pertumbuhan tanaman tomat serta mengetahui pengaruh pengaplikasian pupuk urea dan ZA berbasis *pocket fertigation*. Penelitian dilakukan di *screen house* Kebun Tri Dharma, Banguntapan, Bantul, Daerah Istimewa Yogyakarta. Rancangan penelitian dengan tiga perlakuan yaitu P0 (tanpa pupuk), P1 (pupuk urea dengan dosis 200kg/ha), P2 (pupuk ZA dengan dosis 200kg/ha) dengan tiga kali ulangan. Parameter yang diamati meliputi tinggi tanaman, jumlah cabang, jumlah daun, panjang akar, berat basah, berat kering tanaman tomat, serta karakteristik tanah dan iklim mikro pada *screen house*. Analisa yang digunakan yaitu uji homogenitas, uji anova satu arah, regresi linear, dan pemodelan pertumbuhan menggunakan persamaan model *logistic*. Hasil penelitian menunjukkan perlakuan jenis pupuk nitrogen memberikan hasil berbeda nyata pada parameter berat basah tajuk, berat basah akar, dan berat kering tajuk. Perlakuan P2 memiliki hasil paling tinggi pada berat basah tajuk, berat basah akar, dan berat kering tajuk. Pemodelan matematika dengan model *logistic* dapat digunakan untuk memprediksi laju pertumbuhan tinggi dan jumlah cabang tanaman tomat ( $R^2 > 80\%$ ).

Kata kunci: tanaman tomat, pupuk urea, pupuk ZA, fertigasi, model laju pertumbuhan

**MATHEMATIC MODEL OF RATE GROWTH IN TOMATO (*SOLANUM LYCOPERSICUM* L.) WITH UREA AND ZA FERTILIZER FERTILIZATION BASED ON *POCKET FERTIGATION***  
**ABSTRACT**

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Tomato plant production has increased in Indonesia as tomato demand is growing in the household sector. Fertilization provides plants with the nutrients they require, and one of those is nitrogen. Nitrogen fertilizer applied using a fertigation method can deliver nutrients to the root zone, making it more effective. The goal of this study was to develop the mathematical model of tomato plant growth as well the effect of applying *pocket fertigation*-based urea and ZA fertilizers. This research was conducted at a screen house at Tri Dharma Garden, Banguntapan, DIY. The research design was carried out with three treatment, namely P0 (without fertilizer), P1 (urea fertilizer at a dose of 200 kg/ha), P2 (ZA fertilizer at a dose of 200 kg/ha) with 3 replication. Parameter observed included plant height number of braches, number of leaves, root length, wet weight, and dry weight of tomato plants, as well as soil characteristics and microclimate in the screen house. The analysis was used a homogeneity test, one-way ANOVA test, linear regression, and growth modeling using *logistic* model equations. The results showed that the treatment of nitrogen fertilizer types gave noticeable different results on the parameters of the wet weight of the header, the wet weight of the roots, and the dry weight of the header. P2 treatment has the highest yield on the wet weight of the header, the wet weight of the roots, and the dry weight of the header. Mathematical modeling with *logistic* model can be used to predict the growth rate number of branches of tomato plants ( $R^2 > 80\%$ ).

Keyword: tomato plant, urea fertilizer, ZA fertilizer, *fustigation*, growth rate models.