

## Evaluasi Interaksi Metode Irigasi dan Amandemen Organik terhadap Produktivitas Tanaman Bawang Merah (*Allium cepa L. var. aggregatum*)

### INTISARI

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Tantangan utama dalam pengembangan pertanian di kawasan pesisir yaitu kondisi tanah berpasir dan iklim mikro dengan suhu udara tinggi dan kecepatan angin kuat. Pendekatan melalui kombinasi irigasi mikro dan penambahan amandemen tanah yang sesuai dengan kondisi lahan pasiran pantai dapat menjadi strategi inovatif. Penelitian ini bertujuan untuk menentukan kombinasi perlakuan terbaik antara tipe irigasi (sprinkler dan kabut) dan jenis amandemen tanah (kotoran hewan dan arang sekam) untuk memperbaiki sifat tanah guna menunjang pertumbuhan dan meningkatkan produktivitas tanaman bawang merah (*Allium cepa L. var. aggregatum*). Penelitian dilakukan di Kawasan Pantai Cangkring, D.I. Yogyakarta, pada musim kemarau (Juli s.d- September) tahun 2025. Rancangan desain penelitian menggunakan *Random Complete Block Design*. Enam perlakuan yang diberikan yaitu 1) irigasi sprinkler dengan arang sekam (SPB1), 2) irigasi sprinkler dengan kohe (SPB2), 3) irigasi sprinkler tanpa penambahan amandemen (SPB3), 4) irigasi kabut dengan arang sekam (KBB1), 5) irigasi kabut dengan kohe (KBB2), dan 6) irigasi kabut tanpa penambahan AO (KBB3). Masing-masing perlakuan dilakukan ulangan sebanyak lima kali sehingga total plot yang digunakan sebanyak 30 plot. Pada setiap plot ditanam sebanyak 25 benih tanaman bawang merah. Total tanaman yang diamati selama percobaan sebanyak 150 tanaman. Parameter tanah yang diamati meliputi: berat volume, berat jenis, kadar lengas, kandungan c-organik. Parameter tanaman meliputi: tinggi tanaman, jumlah daun, jumlah dan diameter umbi, dan massa total panen. Analisis statistik dilakukan dengan uji *Two-Way ANOVA* dan pemilihan perlakuan kontribusi dengan metode *Analytical Hierarchy Process (AHP)*. Penelitian ini membuktikan perlakuan tipe irigasi dan jenis amandemen berpengaruh signifikan terhadap berat volume tanah, lengas tanah, sedangkan pada kandungan c-organik tanah, pengaruh signifikan hanya ditunjukkan oleh jenis amandemen. Pada parameter tanaman, variasi tipe irigasi dan jenis amandemen terbukti berpengaruh signifikan terhadap tinggi dan jumlah daun. Terdapat interaksi nyata antara tipe irigasi dan amandemen organik pada parameter jumlah daun. Berdasarkan uji AHP perlakuan SPB1 (irigasi sprinkler dan arang sekam) merupakan perlakuan dengan presentase kontribusi paling tinggi. Artinya perlakuan irigasi sprinkler dan arang sekam baik dalam perbaikan sifat fisik tanah pasiran sehingga mampu meningkatkan produktivitas bawang merah di lahan pasir pesisir.

**Kata Kunci:** Arang sekam; kotoran sapi; lengas tanah; *two-way ANOVA*; bawang merah.

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### **SUMMARY**

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The main challenges in coastal areas for agricultural development are sandy soil conditions and a microclimate characterized by high air temperatures and strong wind speeds. An approach through the combination of micro-irrigation and soil amendments suitable for sandy coastal lands can be an innovative strategy. This study aims to determine the best treatment combination between irrigation type (sprinkler and mist) and soil amendment type (cow manure and rice husk biochar) to improve soil properties in order to support growth and increase the productivity of shallot plants (*Allium cepa L. var. aggregatum*). The research was conducted in the Cangkring coastal area, Yogyakarta Special Region, during the dry season (July to September). The experimental design used was a Randomized Complete Block Design. Six treatments were applied: 1) sprinkler irrigation with rice husk charcoal (SPB1), 2) sprinkler irrigation with cow manure (SPB2), 3) sprinkler irrigation without amendment (SPB3), 4) mist irrigation with rice husk charcoal (KBB1), 5) mist irrigation with cow manure (KBB2), and 6) mist irrigation without amendment (KBB3). Each treatment was replicated five times, resulting in a total of 30 plots. Each plot was planted with 25 shallot seedlings, with a total of 150 plants observed during the experiment. The soil parameters observed included bulk density, particle density, soil moisture, and soil organic carbon. Plant parameters included plant height, number of leaves, number and diameter of bulbs, and total harvest weight. Statistical analysis was performed using Two-Way ANOVA, and the best treatment was determined using the Analytical Hierarchy Process (AHP). The results showed that irrigation type and soil amendment had significant effects on soil bulk density and moisture content, whereas soil organic C content was significantly affected only by the type of amendment. For plant parameters, irrigation type and amendment type significantly influenced plant height and leaf number, with a significant interaction observed between irrigation type and organic amendment on leaf number. Based on the results of the AHP test, the SPB1 treatment showed the highest contribution percentage. This indicates that the combination of sprinkler irrigation and rice husk charcoal amendment is effective in improving the physical properties of sandy soils, thereby enhancing shallot productivity in coastal sandy land.

**Keywords:** Rice husk charcoal; cow manure; soil moisture; two-way ANOVA; shallot.