

RINGKASAN

Lahan pasir pantai di wilayah pesisir Indonesia memiliki potensi untuk pengembangan pertanian, namun tergolong suboptimal akibat karakteristik tanah yang memiliki permeabilitas tinggi, rendahnya kandungan bahan organik, serta cekaman abiotik seperti salinitas dan intensitas angin laut. Kubis yang secara tradisional dibudidayakan di dataran tinggi kini menunjukkan potensi adaptasi terhadap lingkungan dataran rendah melalui pemilihan varietas yang sesuai dan manipulasi iklim mikro.

Penelitian dilaksanakan pada bulan Juli 2024 sampai dengan Oktober 2024 di *screen house* Fakultas Pertanian Universitas Jenderal Soedirman menggunakan Rancangan Acak Kelompok Lengkap (RAKL) dengan dua faktor perlakuan, yaitu salinitas udara yang terdiri dari tiga taraf (0 mS/cm, 12 mS/cm, dan 24 mS/cm) serta volume pembilasan air dengan tiga taraf (0 mm, 3,5 mm, dan 7 mm). Total 27 unit perlakuan diujikan pada 135 polybag menggunakan varietas kubis Grand 22. Variabel yang diamati meliputi parameter pertumbuhan tanaman (tinggi, jumlah daun, luas daun, umur pembentukan krop, dan diameter krop), komponen hasil (bobot segar, bobot kering dan hasil panen), serta indikator fisiologi (kadar klorofil, kadar prolin, bukaan dan kerapatan stomata).

Hasil analisis menunjukkan bahwa peningkatan salinitas udara secara signifikan menurunkan tinggi tanaman, jumlah daun, dan kadar klorofil pada fase vegetatif, yang mengindikasikan terjadinya cekaman fisiologis. Perlakuan volume pembilasan air memberikan pengaruh nyata terhadap peningkatan kadar prolin vegetatif dan bukaan stomata generatif, menunjukkan respons adaptasi terhadap stres osmotik. Salinitas udara dan volume pembilasan menunjukkan pengaruh nyata hanya pada nilai kehijauan daun vegetatif. Hasil tersebut mengindikasikan bahwa tanaman kubis mampu mempertahankan produktivitas melalui mekanisme adaptasi internal, seperti akumulasi prolin dan efisiensi fotosintetik, meskipun berada pada kondisi lingkungan yang menantang.

Kesimpulan dari penelitian ini menegaskan bahwa varietas Grand 22 memiliki toleransi yang relatif tinggi terhadap cekaman salinitas udara apabila didukung oleh manajemen pembilasan yang tepat. Pengembangan budidaya kubis di lahan pasir pantai dapat dilakukan secara berkelanjutan dengan pendekatan teknis berbasis pengelolaan cekaman abiotik. Penelitian lanjutan direkomendasikan dengan mempertimbangkan ekspansi taraf perlakuan, penggunaan varietas yang tepat, dan memahami respons tanaman di suatu kondisi guna memperkaya pemahaman mengenai adaptasi kubis terhadap lingkungan pesisir.

SUMMARY

Coastal sandy land in Indonesia has potential for agricultural development; however, it is considered suboptimal due to soil characteristics such as high permeability, low organic matter content, and abiotic stresses including salinity and sea breeze intensity. Cabbage, which is traditionally cultivated in highland areas, has recently shown potential for adaptation to lowland environments through the selection of suitable varieties and microclimate manipulation.

The research was conducted from July 2024 to October 2024 in the screen house of the Faculty of Agriculture, Jenderal Soedirman University, using a Randomized Complete Block Design (RCBD) with two treatment factors: air salinity consisting of three levels (0 mS/cm, 12 mS/cm, and 24 mS/cm) and water flushing volume with three levels (0 mm, 3.5 mm, and 7 mm). A total of 27 treatment units were applied to 135 polybags using the cabbage variety Grand 22. The observed variables included plant growth parameters (plant height, number of leaves, leaf area, time of head formation, and head diameter), yield components (fresh weight, dry weight, and harvest yield), as well as physiological indicators (chlorophyll content, proline content, stomatal aperture, and stomatal density).

The analysis showed that increasing air salinity significantly reduced plant height, number of leaves, and chlorophyll content during the vegetative phase, indicating the occurrence of physiological stress. Water flushing volume significantly affected the increase in vegetative proline content and generative stomatal aperture, demonstrating an adaptive response to osmotic stress. Air salinity and water flushing showed a significant effect only on vegetative leaf greenness values. These results indicate that cabbage plants are able to maintain productivity through internal adaptive mechanisms such as proline accumulation and photosynthetic efficiency, even under challenging environmental conditions.

The conclusion of this study emphasizes that the Grand 22 variety has relatively high tolerance to air salinity stress when supported by proper flushing management. The development of cabbage cultivation on coastal sandy land can be carried out sustainably through technical approaches based on abiotic stress management. Further research is recommended by expanding treatment levels, using appropriate varieties, and exploring plant responses under specific conditions to enhance understanding of cabbage adaptation in coastal environments.