

RINGKASAN

Tomat dan kubis merupakan tanaman yang kaya manfaat dan memiliki kandungan gizi yang tinggi. Produksi tomat dan kubis perlu ditingkatkan guna memenuhi kebutuhan pangan yang meningkat seiring dengan laju pertumbuhan penduduk. Lahan pasir pantai dapat digunakan untuk lahan pertanian sebagai salah satu upaya meningkatkan produksi pertanian. Lahan pasir pantai merupakan lahan marginal yang memiliki faktor pembatas berupa kecepatan angin tinggi yang mengandung material garam dan dapat merusak tanaman. Hal ini dapat diatasi dengan dibuatnya pematah angin. Tujuan dari penelitian ini adalah mengetahui respon fisiologis tanaman kubis dan tomat terhadap pematah angin di lahan pasir pantai serta mendapatkan jenis pematah angin yang efektif untuk tanaman kubis dan tomat di lahan pasir pantai.

Penelitian ini menggunakan Rancangan Acak Kelompok Lengkap (RAKL) yang terdiri atas 3 faktor. Faktor pertama adalah musim (kemarau dan penghujan). Faktor kedua adalah jenis pematah angin (tanpa pematah angin, pematah angin plastik 1,5 m, pematah angin tanaman jagung 3 baris, dan pematah angin tanaman jagung disela bedengan). Faktor ketiga adalah jenis tanaman (tomat dan kubis). Variabel yang diamati adalah bukaan stomata, kerapatan stomata, kadar klorofil, kadar prolin, kehijauan daun, laju pertumbuhan tanaman, dan indeks panen. Data hasil pengamatan diamati dengan sidik ragam dan dilakukan uji *Duncan's Multiple Range Test* (DMRT) 5%.

Hasil penelitian menunjukkan bahwa respon fisiologis tanaman tomat dan kubis pada perlakuan tanpa pematah angin berupa bukaan stomata rata-rata sebesar 5,77 μm , kerapatan stomata rata-rata 127,21 mm^2 , kadar klorofil 15,56 $\mu\text{g/ml}$, kadar prolin 26,17 $\mu\text{mol/g}$, kehijauan daun 41,51 SPAD unit, laju pertumbuhan tanaman 15,55 $\text{g/m}^2/\text{minggu}$, dan indeks panen 0,33. Respon tanaman tomat dan kubis pada perlakuan pematah angin plastik 1,5 m berupa bukaan stomata rata-rata sebesar 6,89 μm , kerapatan stomata rata-rata 125,45 mm^2 , kadar klorofil 15,90 $\mu\text{g/ml}$, kadar prolin 15,60 $\mu\text{mol/g}$, kehijauan daun 45,72 SPAD unit, laju pertumbuhan tanaman 20,98 $\text{g/m}^2/\text{minggu}$, dan indeks panen 0,40. Respon tanaman tomat dan kubis pada perlakuan pematah angin tanaman jagung 3 baris berupa bukaan stomata rata-rata sebesar 6,28 μm , kerapatan stomata rata-rata 123,94 mm^2 , kadar klorofil 15,91 $\mu\text{g/ml}$, kadar prolin 19,69 $\mu\text{mol/g}$, kehijauan daun 42,68 SPAD unit, laju pertumbuhan tanaman 15,00 $\text{g/m}^2/\text{minggu}$, dan indeks panen 0,40. Respon tanaman tomat dan kubis pada perlakuan pematah angin tanaman jagung disela bedengan berupa bukaan stomata rata-rata sebesar 6,01 μm , kerapatan stomata rata-rata 134,85 mm^2 , kadar klorofil 12,21 $\mu\text{g/ml}$, kadar prolin 21,65 $\mu\text{mol/g}$, kehijauan daun 42,62 SPAD unit, laju pertumbuhan tanaman 18,67 $\text{g/m}^2/\text{minggu}$, dan indeks panen 0,40. Jenis pematah angin yang efektif untuk budidaya tanaman tomat dan kubis di lahan pasir pantai adalah pematah angin plastik 1,5 meter karena memberikan respon fisiologis bukaan stomata, kehijauan daun, laju pertumbuhan tanaman, dan indeks panen tertinggi, serta kadar prolin terendah.

SUMMARY

Tomatoes and cabbage are plants that are rich in benefits and have high nutritional content. The production of tomatoes and cabbage needs to be increased in order to meet the increasing food needs in line with the population growth rate. Sandy beach land can be used for agricultural land as an effort to increase agricultural production. Beach sandy land is a marginal land that has a limiting factor in the form of high wind speeds which contain salt material and can damage plants. This can be overcome by making a windbreaker. The purpose of this study was to determine the physiological response of cabbage and tomato plants to windbreaks in sandy beach fields and to find effective wind breaking types for cabbage and tomato plants in sandy beach fields.

This study used a Complete Randomized Block Design which consisted of 3 factors. The first factor is the season (dry and rainy). The second factor was the type of windbreaker (without windbreaker, 1.5 m plastic windbreak, 3 rows of corn breaking, and corn breaking between beds). The third factor is the type of plant (tomato and cabbage). The variables observed were stomata opening, stomata density, chlorophyll content, proline content, green leaves, plant growth rate, and harvest index. Observational data were observed with variance and a 5% Duncan's Multiple Range Test (DMRT) test.

The results showed that the physiological response of tomato and cabbage plants to the treatment without wind breaks was an average stomatal opening of 5.77 μm , an average stomata density of 127.21 mm^2 , chlorophyll content of 15.56 $\mu\text{g/ml}$, proline content of 26.17 $\mu\text{mol/g}$, leaf greenness 41.51 SPAD units, plant growth rate 15.55 $\text{g/m}^2/\text{week}$, and harvest index 0.33. The response of tomato and cabbage plants to the 1.5 m plastic windbreak treatment was in the form of an average stomatal opening of 6.89 μm , an average stomata density of 125.45 mm^2 , chlorophyll content of 15.90 $\mu\text{g/ml}$, proline content of 15.60 $\mu\text{mol/g}$, leaf greenness 45.72 SPAD units, plant growth rate 20.98 $\text{g/m}^2/\text{week}$, and harvest index 0.40. The response of tomato and cabbage plants to the windbreaker treatment of 3-row corn plants was the average stomata opening was 6.28 μm , the average stomata density was 123.94 mm^2 , the chlorophyll content was 15.91 $\mu\text{g/ml}$, the proline content was 19.69 $\mu\text{mol/g}$, leaf greenness 42.68 SPAD units, plant growth rate 15.00 $\text{g/m}^2/\text{week}$, and harvest index 0.40. The response of tomato and cabbage plants to the wind breaking treatment of corn plants interrupted by beds was the average stomatal opening of 6.01 μm , average stomata density of 134.85 mm^2 , chlorophyll content of 12.21 $\mu\text{g/ml}$, proline content of 21.65 $\mu\text{mol/g}$, leaf greenness 42.62 SPAD units, plant growth rate 18.67 $\text{g/m}^2/\text{week}$, and harvest index 0.40. An effective type of windbreaker for tomato and cabbage cultivation on sandy beach land is a 1.5 meter plastic windbreaker because it provides a physiological response to stomatal openings, leaf greenness, plant growth rate, and the highest yield index, as well as the lowest proline content.