

INTISARI

Penelitian bertujuan 1) Mengetahui pengaruh penambahan tanah lempungan dan biopolimer sebagai bahan pembenah tanah untuk meningkatkan kemampuan menahan lengas dan ketersediaan hara lahan pasir pantai, dan 2) Mengetahui pengaruh penambahan tanah lempungan dan biopolimer untuk meningkatkan produktivitas dan efisiensi air bawang merah di lahan pasir pantai. Percobaan 1 menguji dua faktor yaitu jenis tanah (Inceptisol dan Vertisol) dan jenis polimer (tapioka 1%, tapioka 2%, ampas tapioka 1%, ampas tapioka 2%, PVA 0,1%, dan PVA 0,2%). Percobaan 2 dilakukan di lahan pasir pantai menguji pengaruh volume penyiraman (9, 6, dan 3 mm hari⁻¹) dan jenis kombinasi amelioran (Vertisol + tapioka 1%, Vertisol + PVA 0,1%, Inceptisol + PVA 0,2%, dan Inceptisol + tapioka 1%). Hasil penelitian menunjukkan bahwa tanah didominasi fraksi pasir (99%), KPK, C organik dan N total dan lengas tersedia sangat rendah. Ameliorasi menggunakan Vertisol + tapioka 1% meningkatkan kadar lengas tersedia menjadi 5,22%. Lempung dan polimer perekat alami nyata meningkatkan KPK, kation tersedia, dan daya sangga tanah pasir pantai. Ameliorasi mengurangi pelindian kation dan meningkatkan serapan N, P dan K bawang merah. Percobaan pada media dalam polibag di rumah kaca menunjukkan bobot segar umbi dipengaruhi oleh jenis polimer perekat yang digunakan. Bobot segar umbi dari perlakuan tapioka 1% sebesar 34,17 g rpn⁻¹ meningkat 138,5% dibandingkan tanah pasir pantai tanpa amelioran demikian juga PVA 0,1 dan 0,2% memproduksi umbi dengan berat yang tidak berbeda nyata dibandingkan tapioka 1%. Percobaan di lahan pasir pantai menunjukkan ameliorasi menggunakan Vertisol + PVA 0,1% mencapai hasil umbi tertinggi yaitu bobot segar 23,61 t ha⁻¹ dan bobot kering 21,89 t ha⁻¹. Ameliorasi menggunakan Vertisol + PVA 0,1% dan Inceptisol + PVA 0,2% dengan penyiraman 3 mm hari⁻¹ mencapai efisiensi penggunaan air tertinggi, masing-masing sebesar 7,31 dan 7,07 kg m⁻³. Ameliorasi di lahan pasir pantai menggunakan Vertisol + PVA 0,1% direkomendasikan sebagai teknologi rekayasa kesuburan pada pengembangan bawang merah di lahan pasir pantai.

Kata kunci : tanah pasir pantai, tanah lempung, tapioka, polyvinylalcohol, bawang merah

ABSTRACT

The research is aimed to; understand the effect of clay and biopolymers as materials to improve the moisture and nutrient retention in coastal sandy soil, and explore the effect of adding clay and biopolymers on the productivity of shallot in coastal sandy soil. The first stage experiment examined two factors including clay ameliorant (5% clay whether from Inceptisol and Vertisol) and biopolymer (1% and 2% tapioca, 1% and 2% tapioca dregs, 0.1% and 0.2% polyvinylalcohol). The second stage of the experiment held on coastal sandy soil to examined the effect of watering volume (9, 6, and 3 mm day⁻¹) and ameliorant combination (Vertisol + 1% tapioca, Vertisol + 0.1% PVA, Inceptisol + 0.2% PVA, and Inceptisol + 1% tapioca). The results show that the soil is dominated by sand fraction (99%) with low value of CEC, available cations, Organic C, total N, and available water. Amelioration using Vertisol + 1% tapioca increases available water content to 5.22%. Clay and natural polymer also increased CEC, available cations, and buffering capacity of coastal sandy soil. Amelioration reduces cations leaching and increases the uptake of N, P and K of shallot. The experiment on polybags in screen house indicates that the bulb fresh weight is affected by the type of adhesive polymer used. The bulb fresh weight in the treatment 1% tapioca is 34.17 g plant⁻¹. It increases by 138.5% compared to coastal sandy soil without ameliorant. This also happen to 0.1 and 0.2% PVA which produces similar results with 1% tapioca. The experiment in coastal sandy soil also demonstrated that amelioration using Vertisol + 0.1% PVA reaches the highest bulb yield, that is 23.61 tones ha⁻¹ of fresh bulb weight and 21.89 tones ha⁻¹ of dry bulb weight. Amelioration using Vertisol + 0.1% PVA and Inceptisol + 0.2% PVA combined with the watering of 3 mm day⁻¹ reach the highest water use efficiency which reached 7.31 and 7.07 kg m⁻³ respectively. Amelioration of coastal sandy land using Vertisol + 0.1% PVA is recommended as technology to improve soil fertility and shallot productivity.

Key Words: coastal sandy soil, clay soil, tapioca, polyvinylalcohol, shallot