RINGKASAN

DHONA PUSPITA NINGRUM. 0810480144. Aplikasi Cendawan Mikoriza Arbuskular (CMA) dan Bokashi dalam Meminimalisir Pemberian Pupuk NPK Pada Produksi Benih Tanaman Jagung Ketan (*Zea Mays Ceratina*). Di bawah bimbingan Dr. Ir. Titin Sumarni, MS. sebagai Dosen Pembimbing Utama dan Dr. Anton Muhibuddin, SP., MP. sebagai Dosen Pembimbing Pendamping.

Jagung (*Zea mays.* L.) merupakan salah satu komoditi tanaman pangan yang cukup penting bagi kebutuhan manusia. Jenis jagung yang dibudidayakan di Indonesia bermacam-macam, salah satu jenis jagung yang perlu dikembangkan, diproduksi dan ditingkatkan di Indonesia adalah jagung ketan (*Zea mays ceratina*). Penanaman jagung ketan di Indonesia masih belum banyak dilakukan. Beberapa wilayah yang melakukan penanaman jagung ketan ini diantaranya Sulawesi, Sumatera dan Jawa. Terbatasnya wilayah penanaman jagung ketan ini salah satu penyebabnya adalah adanya permasalahan benih, sehingga untuk dapat mengembangkan produksi jagung ketan ini perlu dilakukan upaya dalam peningkatan produksi benih. Selama ini, upaya peningkatan produksi tanaman jagung dilakukan dengan meningkatkan dosis pupuk anorganik, tetapi hasil yang didapat masih rendah. Hal tersebut diduga penggunaan pupuk anorganik yang diberikan berlebihan itu tidak sepenuhnya dapat digunakan oleh tanaman. Selain itu, pemberian pupuk anorganik secara berlebihan dalam jangka panjang akan menaikkan keasaman tanah yang berdampak buruk terhadap mikroorganisme yang ada di dalam tanah (Yusnaini, 2009). Oleh karena itu, perlu diupayakan suatu teknologi yang ramah lingkungan untuk dapat mengefektifkan pemupukan serta memperbaiki tingkat kesuburan tanah melalui pemberian bokashi dan penggunaan mikroba-mikroba potensial seperti cendawan mikoriza arbuskular (CMA). Tujuan utama dilaksanakannya penelitian ini adalah untuk mengetahui pengaruh aplikasi cendawan mikoriza arbuskular (CMA) dan bokashi dalam meminimalisir pemberian pupuk anorganik pada produksi benih tanaman jagung ketan (*Zea mays certaina*). Adapun hipotesis yang diusulkan adalah : 1) Pemberian CMA dan atau bokashi dapat meningkatkan produksi benih tanaman jagung ketan, 2) Pemberian CMA dan atau bokashi dapat menurunkan penggunaan pupuk NPK anorganik

Penelitian dilaksanakan di kebun percobaan Fakultas Pertanian, desa Jatikerto, kecamatan Kromengan, kabupaten Malang. Waktu pelaksanaan penelitian ini mulai Bulan Mei 2012 sampai November 2012. Metode penelitian yang digunakan adalah Rancangan Acak Kelompok dengan 10 perlakuan dan 3 kali ulangan. Perlakuan P_0 = pupuk anorganik 100%, P_1 = Bokashi + pupuk anorganik 100%, P_2 = Bokashi + pupuk anorganik 75%, P_3 = Bokashi + pupuk anorganik 50%, P_4 = CMA + pupuk anorganik 100%, P_5 = CMA + pupuk anorganik 75%, P_6 = CMA + pupuk anorganik 50%, P_7 = CMA + Bokashi + pupuk anorganik 100%, P_8 = CMA + Bokashi + pupuk anorganik 75%, P_9 = CMA + Bokashi + pupuk anorganik 50%. Pengamatan tanaman jagung dilakukan secara destruktif dan non destruktif. Pengamatan non destruktif dilakukan setiap 2 minggu sekali. Pengamatan non destruktif meliputi : tinggi tanaman dan jumlah daun. Pengamatan destruktif dilakukan 2 minggu sekali hingga panen dengan cara

mengambil 4 tanaman pada masing masing plot perlakuan tiap ulangan. Pengamatan destruktif meliputi : luas daun, bobot kering total tanaman, bobot kering tongkol, bobot pipilan kering tiap tongkol, panjang tongkol, diameter tongkol, tongkol penuh, bobot 100 biji kering, besar infeksi mikoriza pada akar. Parameter pengamatan meliputi : analisis tanah, analisis bokashi dan analisis untuk besar infeksi mikoriza pada akar. Data pengamatan yang diperoleh dianalisis dengan menggunakan uji beda nyata terkecil (BNT) pada taraf nyata 5%.

Hasil penelitian menunjukkan aplikasi pupuk bokashi dan atau CMA secara umum memberikan pertumbuhan dan hasil produksi benih jagung ketan yang lebih baik dibandingan tanpa ada penambahan bokashi dan atau CMA. Pemberian bokashi + CMA + pupuk anorganik 75%, bokashi + CMA + pupuk anorganik 100%, bokashi + CMA + pupuk anorganik 50%, CMA + pupuk anorganik 75% dan CMA + pupuk anorganik 100%, mampu menghasilkan hasil biji ton ha-1 masing-masing sebesar 4.59 ton ha-1, 4.46 ton ha-1, 4.41 ton ha-1, 4.11 ton ha-1, 4.06 ton ha-1, sehingga terdapat peningkatan masing-masing sebesar 56.66%, 52.22%, 50.51%, 40.27%, dan 38.57% dibandingkan dengan hasil biji ton ha-1 pada tanaman yang hanya dipupuk dengan pupuk anorganik 100%, yakni sebesar 2.93 ton ha-1. Penambahan bokashi dan atau CMA dapat meminimalisir pemberian pupuk anorganik pada perlakuan bokashi + pupuk anorganik 100% (P_1), bokashi + pupuk anorganik 75% (P_2), bokashi + pupuk anorganik 50% (P_3), CMA + pupuk anorganik 100% (P_4), CMA + pupuk anorganik 75% (P_5), CMA + pupuk anorganik 50% (P_6), CMA + bokashi + pupuk anorganik 100% (P_7), CMA + bokashi + pupuk anorganik 75% (P_8), CMA + bokashi + pupuk anorganik 50% (P_9) masing-masing sebesar 32.76%, 48.55%, 53,75%, 38.57%, 55.20%, 65.36%, 52.22%, 67.50%, dan 75.26%.

SUMMARY

DHONA PUSPITA NINGRUM. 0810480144. Applications of Arbuscular Mycorrhizal Fungi (AMF) and Bokashi To Minimize The Inorganic Fertilizer on Seed Production of Waxy Corn (*Zea mays ceratina*). Under supervised by Dr. Ir. Titin Sumarni, MS. and Dr. Anton Muhibuddin, SP., MP.

Maize (*Zea mays.* L.) is one of the crop that is quite important for human needs. There are some types of corn which are cultivated in Indonesia, one of the maize type that needs to be developed, produced and improved in Indonesia is waxy corn (*Zea mays ceratina*). Waxy corn is not widely cultivated in Indonesia. Some areas which have planted the waxy corn are Sulawesi, Sumatera, and Java. The limited cultivation area of waxy corn is one of the reasons of the seeds problems, so to develop the production of waxy corn, it takes an effort in increasing seed production. So far, efforts to increase maize production done by increasing the dose of inorganic fertilizers, but the results are still low. It was anticipated that the excessive use of inorganic fertilizers not entirely can be used by plant. In addition, excessive inorganic fertilizer in the long term will increase the soil acidity that adversely affect the microorganisms in the soil (Yusnaini, 2009). Therefore, it is necessary an environmentally friendly technology in order to streamline and improve the fertilization of soil fertility through the application of bokashi and use of microbes such potential arbuskular mycorrhizal fungi (AMF). The main purpose of the implementation of this research is to know the effect of application arbuskular mycorrhizal fungi (AMF) and Bokashi to minimize inorganic fertilizer on seed production of waxy corn (*Zea mays certaina*). The hypothesis of this research are : 1) The applications of arbuskular mycorrhizal fungi and or bokashi can increase the seeds production of waxy corn, 2) The applications of arbuskular mycorrhizal fungi and or bokashi can decrease the use of inorganic fertilizer.

The research was conducted at experimental farm of Agriculture Faculty, Jatikerto village, Kromengan district, Malang. The research began on May 2012 until November 2012. The research used a randomized block design arranged in non factorial with 10 treatments and 3 replications. The treatments as follow P_0 = inorganic fertilizer 100%, P_1 = Bokashi + inorganic fertilizer 100%, P_2 = Bokashi + inorganic fertilizer 75%, P_3 = Bokashi + inorganic fertilizer 50%, P_4 = AMF + inorganic fertilizer 100%, P_5 = AMF + inorganic fertilizer 75%, P_6 = AMF + inorganic fertilizer 50%, P_7 = AMF + Bokashi + 100% inorganic fertilizer, P_8 = AMF + Bokashi + inorganic fertilizer 75%, P_9 = AMF + Bokashi + 50% inorganic fertilizer. Maize observations conducted destructive and non destructive. Non-destructive observations performed every 2 weeks. Non-destructive observations include: plant height and amount of leaf. Destructive observations performed 2 weeks until harvest by taking 4 plants in each plot replicates of each treatment. The destructive observations include: leaf area, total plant dry weight, dry weight cob, shelled dry weight per cob, cob length, cob diameter, dry weight of 100 seeds, the mycorrhizal infection in roots. Parameter observations include: soil analysis, bokashi analysis and analysis for mycorrhizal infection in roots. The data

analyzed by analysis of variant at 5% level. Then the significant difference continued by Least Significant Different Test at 5% level.

The results showed application of bokashi fertilizer and or AMF generally provide growth and yield of waxy corn seed production are better compared with no addition of bokashi and or AMF. Aplplication of bokashi + AMF + 75% inorganic fertilizer, bokashi + AMF + 100% inorganic fertilizer, bokashi + CMA + 50% inorganic fertilizers, AMF + 75% inorganic fertilizer and AMF + 100% inorganic fertilizer, capable to produce a grain yield tons ha^{-1}, respectively 4,59 ton ha^{-1}; 4,46 ton ha^{-1}; 4,41 ton ha^{-1}; 4,11 ton ha^{-1}; 4,06 ton ha^{-1}, so that there is increased respectively by 56.66%, 52.22%, 50.51%, 40.27%, dan 38.57% as compared to grain yield tons ha^{-1} in plants only fertilized with inorganic fertilizer 100%, which is equal to 2.93 ton ha^{-1}. Aplplication of bokashi and or mikoriza capable to minimize anorganic fertilizer on the treatment bokashi + inorganic fertilizer 100%, bokashi + inorganic fertilizer 75%, bokashi + inorganic fertilizer 50%, AMF + inorganic fertilizer 100%, AMF + inorganic fertilizer 75%, AMF + inorganic fertilizer 50%, AMF + bokashi + inorganic fertilizer 100%, AMF + bokashi + inorganic fertilizer 75%, AMF + bokashi + inorganic fertilizer 50%, respectively 32.76%, 48.55%, 53,75%, 38.57%, 55.20%, 65.36%, 52.22%, 67.50%, and 75.26%.