

**EVALUASI KINERJA ALAT TANAM BENIH TIPE DORONG
BERDASARKAN VARIASI KECEPATAN OPERASI DAN DIMENSI
LUBANG *SEED METERING DEVICE* UNTUK BENIH PADI DI LAHAN
TANPA OLAH TANAH**

INTISARI

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Dimensi lubang *Seed Metering Device* (SMD) dan kecepatan operasi dapat mempengaruhi kinerja alat tanam benih padi tipe dorong pada sistem penanaman benih langsung. Penelitian ini bertujuan untuk mengevaluasi distribusi keluaran benih, kapasitas kerja, efisiensi kerja, dan kendala teknis alat tanam benih padi tipe dorong di lahan tanpa olah tanah. Perlakuan yang diuji terdiri atas tiga dimensi lubang SMD, yaitu SMD 1, SMD 2, dan SMD 3, serta tiga tingkat kecepatan operasi, yaitu 1 km/jam, 2 km/jam, dan 3 km/jam. Data keluaran benih dianalisis secara deskriptif dan dilanjutkan dengan analisis ANOVA dua arah. Hasil penelitian menunjukkan bahwa dimensi lubang SMD yang lebih kecil cenderung menghasilkan distribusi benih yang lebih mendekati target 1-2 benih per titik tanam, sedangkan dimensi lubang SMD yang lebih besar meningkatkan kejadian keluarnya lebih dari dua benih per titik tanam. Hasil analisis ANOVA menunjukkan bahwa kecepatan operasi, dimensi lubang SMD, dan interaksi keduanya berpengaruh nyata terhadap keluaran benih ($p < 0,05$). Kapasitas kerja alat meningkat seiring peningkatan kecepatan operasi, sedangkan efisiensi kerja cenderung menurun akibat meningkatnya kehilangan waktu selama pengoperasian. Kendala teknis yang teridentifikasi meliputi kondisi permukaan lahan tanpa olah tanah dan sifat alir benih. Berdasarkan hasil penelitian, dimensi lubang SMD 1 pada kecepatan operasi 1 km/jam merupakan kondisi operasi yang paling sesuai.

Kata kunci: alat tanam benih tipe dorong, penanaman benih langsung, distribusi benih, *Seed Metering Device* (SMD), padi, lahan tanpa olah tanah

**PERFORMANCE EVALUATION OF A PUSH-TYPE SEEDER BASED ON
VARIATIONS IN OPERATING SPEED AND SEED METERING DEVICE
HOLE DIMENSIONS FOR RICE SEEDING UNDER NO-TILLAGE
CONDITIONS**

ABSTRACT

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The hole dimensions of the Seed Metering Device and the operating speed can affect the performance of a push-type rice seeder in a direct seeding system. This study aimed to evaluate seed output distribution, field capacity, work efficiency, and technical constraints of a push-type rice seeder under no-tillage conditions. The treatments consisted of three SMD hole dimensions, namely SMD 1, SMD 2, and SMD 3, and three levels of operating speed, namely 1 km/h, 2 km/h, and 3 km/h. Seed output data were analyzed descriptively and further examined using two-way ANOVA. The results showed that smaller SMD hole dimensions tended to produce a seed distribution closer to the target of 1-2 seeds per planting point, whereas larger SMD hole dimensions increased the occurrence of more than two seeds per planting point. The ANOVA results indicated that operating speed, SMD hole dimension, and their interaction had a significant effect on seed output ($p < 0.05$). Field capacity increased with higher operating speed, while work efficiency tended to decrease due to increased time losses during operation. The identified technical constraints included the surface condition of no-tillage fields and the flow characteristics of the seeds. Based on the results, SMD 1 at an operating speed of 1 km/h was the most suitable operating condition.

Keywords: push-type seed planter, direct seeding, seed distribution, Seed Metering Device (SMD), rice, no-tillage land