

ABSTRACT

Corn (*Zea mays* L.) is one of the important commodities besides rice as a producer of carbohydrates and staple food in Indonesia. In addition, corn is also widely used as animal feed and industries such as pharmaceutical, cosmetics and chemical products. However, the process of planting corn seeds is currently a separate obstacle due to farmers' agricultural cultural mismatches and high operational costs.

Research and development of more effective and efficient corn seed planting tool is needed to overcome the inhibiting factors by making a planting tool using the awl needle method. In general, the regulation and expenditures of corn seeds uses Seed Matering Device (SMD), while this planting tool uses awl needle and can be operated on unprocessed land, thereby reducing the cost of land preparation. In addition, this study aims to modifying the corn planting tool so that it can be operated on land without tillage, measuring the performance of a corn planting tool (seeder) using the awl needle method, and designing an effective and efficient corn planting tool.

The results of the study showed that the modification of the manual corn planting tool (seeder) was located in the change in expenditures system of the SMD to the the awl needle system. Then the modification of corn planting tools is done by making furrow opener which resembles a "singkal" plow to facilitate the opening of the planting groove. The performance of the seed planting tool (seeder) using the needle method produces an average load of no-load seeds as much as 3 seeds / holes and the percentage of broken seeds is 3% of the total fall seeds, the average seed expenditure is 3 seeds / percentage, percentage broken seeds 0.66% of the total number of seeds fell, and the average spacing between holes 0.77 meters. The design of an effective and efficient corn planting tool (seeder) can be made with specifications: Bearing diameter: 5 cm; Hopper length: 40 cm x 30 cm x 50 cm; Distance between Bearings: 40 cm; Wheel circumference: 70 cm; Front wheel height: 3cm; Furrow opener: 5 cm x 1 cm x 1 cm; Recovery: 3 cm x 5 cm x 1cm; Awl needle: 53 cm; Steering handlebar: 15 cm x 50 cm x 10 cm; and wheel leg length: 25 cm. Corn planting tools (seeder) using needle method have an effective and efficient performance to facilitate the process of planting corn seeds.

Keywords: Planting Tool, Corn (*Zea Mays* L.), Seed Drill, Awl Needle