

Enhancing Wheat Productivity for Small-Scale Farmers in the Northern State of Sudan through Developing a Local Made Seed Cleaner and Different Seeding Methods

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Abstract : The wheat cleaner was designed, manufactured, and tested in the workshop of the department of agricultural engineering, faculty of agricultural sciences, university of Dongola, the northern state of Sudan, for the purpose of enhancing productivity for small-scale-farmers who used to plant their saved wheat seeds every season with all risk of weed infestation and low viability. A one-season field experiment was then conducted according to the Randomized Complete Block Design (RCBD) experimental design in the demonstration farm of Dongola research station using clean seeds and unclean seeds of a local wheat variety (Imam); two different planting methods were also adopted in the experiment. One is the traditional seed drilling within the recommended seed rate (50 kg.feddan⁻¹), whereas the other was the precision seeding method using half of the recommended seed rate (25 kg.feddan⁻¹). The effect of seed type and planting method on field parameters were investigated, and the data was then analyzed using a computer application SAS system version 9.3. The results revealed significant ($P \geq 0.05$) and highly significant ($P \geq 0.01$) differences between treatments. The precision seeding method with clean seeds increased the number of kernels per spike (KS), tillers per plant (TPP), one thousand kernels mass (TKM), the biomass of wheat (BWT), and total yield (TOY), whereas weeds per area (WSM), the biomass of weeds (BWD) and weight of weed seeds were apparently decreased compared to seed drilling with unclean seed. Wheat seed cleaner could be of great benefit for small-scale wheat farmers in Sudan who cannot afford the cleaned seeds commercially provided by the local government.

Keywords : wheat cleaner, precision seeding, seed drilling method, small-scale farmers

Conference Title : ICPAFW 2022 : International Conference on Precision Agriculture and Food Waste

Conference Location : Toronto, Canada

Conference Dates : September 20-21, 2022