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Effects of Different Tire Configurations on Tractor Performance

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**Abstract:** The effects of tire ply constructions (radial and bias) and tire arrangements (singles and duals on rear the axle) on tractor performance were evaluated for 2 gear levels on 2 different fields covered with wheat stubble and having different soil types, clay and sandy-loam. For this purpose, the tractor's overall efficiency, specific fuel consumption, and slip values were determined using parameters measured in the study. The results showed that the use of radial tires provided some advantages. For example, overall tractor efficiency with radial tires instead of bias tires increased by 3.44%, while specific fuel consumption decreased by 3.08% on average. When operating with dual tires instead of single tires, overall efficiency increased by 14.73%, while specific fuel consumption decreased by 12.77% on average. Radial-ply tires did not provide a considerable reduction (6.7% on average) in terms of slip compared to bias-ply tires, while the use of duals reduced the slip by 34% on average. Variance analysis was performed and evaluated to determine the statistical significance of effects on the performance of the factors and their interactions. According to the statistical results, the best results were obtained with radial tires in dual configuration.

**Key Words:** Tractor Performance, Tire Configuration, Bias and Radial Tires

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