

Measurement of weight transfer in two wheel drive tractor by developed ring transducer

■ MAHESH R. PATIL

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Correspondence to :

MAHESH R. PATIL
Department of Farm
Machinery and Power,
College of Agricultural
Engineering and Technology,
Dr. Balasaheb Sawant Konkan
Krishi Vidyapeeth, Dapoli,
RATNAGIRI (M.S.) INDIA
Email : maheshtpatil999@gmail.com

■ **ABSTRACT** : Weight transfer or weight shift is, in fact, reaction transfer or change in the reactions of front and rear wheels of the tractor. Weight transfer because of drawbar loading decreases soil reaction against the front wheels and increases reaction against the rear wheels. A study was done to measure the dynamic front wheel reaction of the tractor and thereby the weight transfer from front to the rear wheel. Developed ring transducer was attached below the tractor's front axle to measure the front wheel reaction. Field experiments were conducted using Ford-3630 tractor with three different implements viz., 3-bottom mould board plough, 9-tine cultivator and offset disc harrow. For each operation, the parameters such as dynamic front wheel reaction, draft, slip and depth were measured. The instrumented link forces were used to calculate implement draft. Slip was calculated by measuring actual speed in the field at different depths and theoretical speed on a concrete surface in the same gear and throttle position. The dynamic front wheel reaction was measured by using the developed ring transducer and thus, the weight transfer from front to rear was calculated. Also the weight transfer for a given draft was calculated theoretically and compared with the experimentally determined weight transfer. The data indicated that weight transfer increased with increase in draft. The maximum variation between theoretical and experimental values of weight transfer was found to be 12.62 per cent. This variation may be due to some assumptions made in theoretical calculation as well as due to vibration of the front axle while operating the tractor in the field.

■ **KEY WORDS** : Weight transfer, Dynamic front wheel reaction, Ring transducer, Draft, Slip

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