The benefits of achieving optimal tyre performance in farming

Many of the factors affecting agricultural productivity are beyond the farmer's control. Challenges facing farmers today include fuel prices, market fluctuations and unfavourable weather conditions; so, it really makes sense not to neglect those factors they can do something about.

One of the most important, but frequently misunderstood, is tyres, says Stephan van Staden, national agricultural specialist at Bridgestone, a manufacturer of specialised agricultural tyres.

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"Farmers are generally very open to innovation because they know they need all the help they can get. Clearly, that's absolutely the right approach but they must also be careful not to ignore the large gains that they can obtain from managing their tyres," says van Staden.
"In particular, maintaining proper tyre inflation pressures and setting up ballast can save an enormous amount of money and increase productivity."

Lowest practical tyre inflation

Van Staden explains that tyres account for 20-40% of horsepower loss, and thus optimising their efficacy through correct pressure and ballast will reduce that percentage. The key here is to ensure that the optimal amount of tyre surface engages with the field surface—an optimal footprint will maximise the tractor's efficiency in performing its task while minimising fuel use. It will also prolong the tyre's life.

Achieving the optimal tyre footprint means calculating the lowest tyre inflation needed to carry the load. Of course, part of the load will be the ballast needed to give the tractor the necessary weight for a particular job.

Another advantage of the lowest practical tyre inflation is that soil compaction is minimised, thus contributing to the overall health of the soil.

"It's important to understand that there is no 'best tyre pressure' for a tractor'—the tyre pressure must be calculated according to the load it is carrying in each case," he explains. "The benefits can be quite extraordinary. A study at Ohio State University showed that using the correct tyre inflation improved fuel consumption by between 5.3% and 26.5%, and the time spent per acre by 0.8 to 11%. Achieving these kinds of savings can make a significant impact on a farmer's margins, especially if they are sustained over the long term."

He adds that fuel has now become the second largest input cost to farmers, so any consistent saving of fuel costs is highly advantageous.

Tyres are an integral part of tractors

In order to set up a tractor correctly, the first step is to ensure that tyres of the correct size are fitted. Then it is necessary to determine the correct weight split between front and rear, and then the amount of weight on each tyre. Ballast may need to be added depending on what equipment the tractor is pulling, and this will affect the weight split.

While hydroinflation has been traditionally used for ballasting and is cheap, it has a number of disadvantages. The modern trend is to rely on dry weights. Hydroinflation is, in any event, not suitable for radial tyres, which are increasingly being used in agriculture because they offer a 6-14% performance improvement over cross-ply tyres.

It's important to check tyre pressures regularly to ensure that tyres remain at the correct pressure. This should be done weekly at a minimum, and an accurate gauge will pay for itself very quickly.

"Taking the time to ensure tyres are inflated to the optimal pressure, and that the weight of the tractor is correctly calculated and distributed, will ensure that equipment does the best possible job in the shortest possible time—while using the least fuel possible," concludes van Staden.