

DLG Test Report 7026

Apollo Vredestein B.V.

Agricultural tyres for tractors

Wear behaviour under real conditions



VREDESTEIN TRAXION XXL

✓ **Wear behaviour
under real conditions**

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Overview

A test mark „DLG-APPROVED for individual criteria“ is awarded for agricultural products which have successfully fulfilled a scope-reduced usability testing conducted by DLG according to independent and recognized evaluation criteria. The test is intended to highlight particular innovations and key criteria of the test object. The test may contain criteria from the DLG test scope for overall tests, or focus on other value-determining characteristics and properties of the test subject. The minimum requirements, test conditions and procedures as well as the valuation bases of the test results will be specified in consultation with an expert group of DLG.



They correspond to the recognized rules of technology, as well as scientific and agricultural knowledge and requirements. The successful testing is concluded with the publication of a test report, as well as the awarding of the test mark which is valid for five years from the date of awarding.

The endurance test “Wear behaviour under real conditions” consists of tests of agricultural tyres on tractors in real working conditions. As a result of rising transport tasks on the road with agricultural machines, the cost factor of “tyres” becomes more and more important. The cost factor of “tyres” includes tyre wear and the associated change intervals. To get more realistic data on this topic the DLG developed a well-defined measurement procedure to represent and accurately compare tyre wear results of different tyres.

In this test the Vredestein Traxion XXL was compared with a tyre from another premium tyre manufacturer. The size dimensions of the tyres were 600/70R28 on the front axle and 710/70R42 on the rear axle. All test tyres were assembled onto a John Deere 6215R. In total the test included six identical test machines, divided over two agricultural contractors in Germany. To determine different working situations, in the field, transport and road tasks on the street, plus the idle hours, every tractor had a JD Link System installed to get real working machine data during the whole test period.

The Product

Manufacturer and applicant

Apollo Vredestein B.V., P.O. Box 27,
7500 AA Enschede, The Netherlands

Product: Vredestein Traxion XXL

Description and Technical Data

Technical instructions and data can be found on the manufacturer’s website:

<http://www.vredestein.com>

Assessment in brief

The test results showed the Vredestein tyre was very good in comparison with the competitive reference. At the same working conditions for both test candidates the tyre wear of the “Traxion XXL” is clearly lower. As a result, the lifetime and therefore the economic efficiency of the Vredestein tyre are visually better.

Table 1:
General results

Test criterion	Evaluation*
tyre wear behaviour	++

* Evaluation range: + + / + / o / - / - - (o = standard)

The Method

In context of the long-term test six tractors at two agricultural contractors were assembled with the serial tyres to be tested. One machine per contracting company had the Vredestein Traxion XXL tyre with the size 600/70 R28 on the front axle (FA) and 710/70 R42 on the rear axle (RA). The same reference tractors, all John Deere 6215R, were equipped with tyres in the same size from another manufacturer of premium tyres during the same time period of 15 months. The goal at the beginning of the test was to find machines which run mostly on the road, because the tyre wear on the road is higher than the tyre wear experienced on the field.

To be able to judge the measurement results, each test machine was fitted with a JD Link telematics system, which records the relevant important machine data during the test. Based on this the operation hours could be defined in different conditions with fixed criteria's. The operation modes were defined in idle hours, operation time with low working speed (e.g. working on the field) and

operation time with high working speed (e.g. transport on the road).

The DLG developed a defined measurement procedure to be able to document comparable results of measurement for the tyre wear behaviour. Before the test starts every tyre was equipped with predefined measurement points. Each tyre received drill holes in the lugs, which were filled with measurement pins. These measurement pins act as depth stops. To avoid mistakes each measuring point was coded. This criteria was guaranteed to measure the absolute tyre wear during the whole test always at the same position. In each tyre 12 measuring points were defined on the tyre circumference. This allowed a statistic inspection respective to the tyre wear around the whole tyre range and the performance respective to tyre wear both transversal and longitudinal. This allowed a statistic inspection respective to the tyre wear around the whole tyre circumference as well as the wear behavior in both transversal and longitudinal direction.

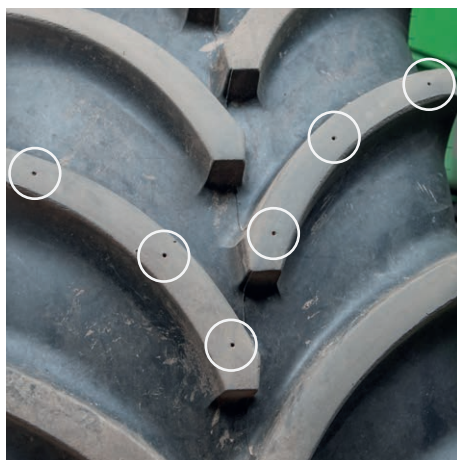


Figure 2:
Measure points on a pair of lugs



Figure 3:
Wear measurement with depth stop

Table 2:
Test details

	Contractor 1		Contractor 2			
	Machine 1	Machine 2	Machine 3	Machine 4	Machine 5	Machine 6
Equipped with	Vredestein Traxion XXL	Reference	Vredestein Traxion XXL	Reference		
Dimension FA/RA	600/70R28 and 710/70R42					
Load index FA/RA	157D/173D	157D/173D	157D/173D	157D/173D	157D/173D	157D/173D
Lug Height FA/RA* [mm]	51/58	52/64	51/58	52/64		
Tyre pressure FA/RA [bar]	1,8/1,8					

* manufacturer's information

Detailed account of the test results

During the whole test period of 15 months each machine achieved approximately the same operation hours. One tractor at contracting firm two, which was fitted with the competitive reference tyres, was out of range due to the operation mode profile differing extremely to the other test machines. The statistic inspection therefore includes five tyre sets, 2x Vredestein and 3x the reference. The general data at the end of the test is listed in table 3. To analyse and compare the observed results, respective to the lifetime of the tyres, in table 4 some assumptions were taken. The following results of the comparison are shown in figure 4 and 5.

Table 3:
General data at the end of test (in average)

	Vredestein Traxion XXL		Reference	
Idle operation hours [h]	250/22 %		314/26 %	
Operation hours with high working speed [h]	349/31 %		381/31 %	
Operation hours with low working speed [h]	525/47 %		516/43 %	
Total machine hours during test period [h]	1124		1211	
Amount of test relevant machine hours [h]	874		897	

	Vredestein Traxion XXL		Reference	
Results without operation hours in low idle part	FA	RA	FA	RA
Absolute tyre wear in test [mm]	5.55	6.02	10.88	10.56
Normalized tyre wear in test [mm/1.000 h]	6.34	6.92	12.13	11.77

Table 4:
Basics to compare the measurement results

	Vredestein Traxion XXL		Reference	
	FA	RA	FA	RA
Lug Height in new condition (100%)* [mm]	51	58	52	64
Wear down to 10 mm lug height (defined wear limit) [mm]	41	48	42	54

* manufacturer's information

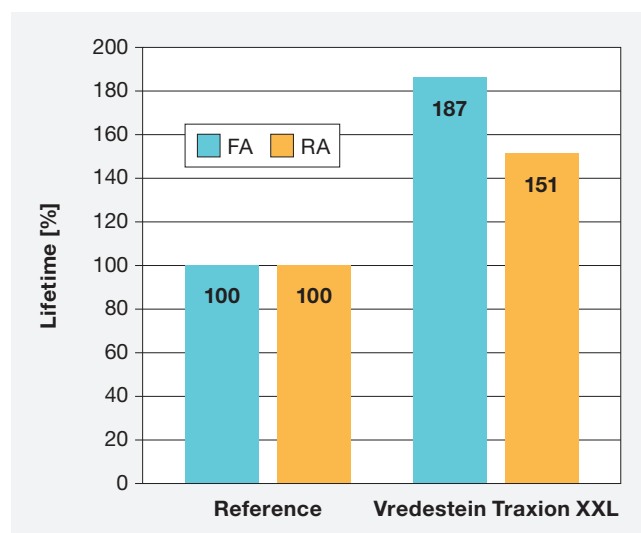
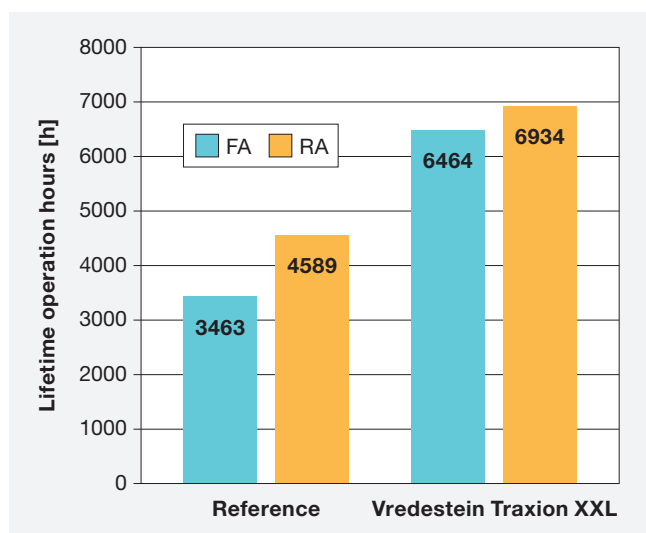


Figure 4 and 5:
Determined lifetime in comparison

When the costs for a tyre set are entered, it is possible to show the economic effect. The price for a tyre set depends on the dealer and his trading terms. In this case we determined a price of € 11.000 for an average on both test candidates.

Table 5:
Comparison of costs with a purchase price of 11.000 €

	Vredestein Traxion XXL		Reference	
	FA	RA	FA	RA
Purchase price per axle [€]	3.500	7.500	3.500	7.500
Costs per tyre per operation hour [€/h]	0,27	0,54	0,51	0,82
Costs per axle per operation hour [€/h]	0,54	1,08	1,01	1,63

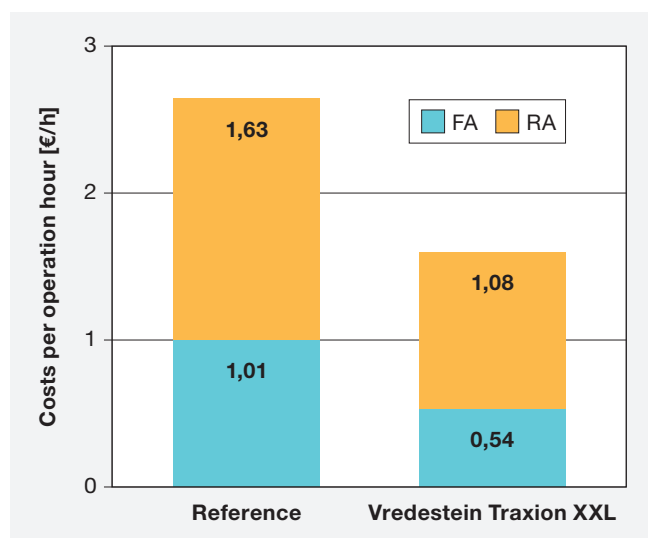


Figure 6:
Comparison of costs per operational hour

Summary

The tested agricultural tyre “Vredestein Traxion XXL” with the tyre size 600/70 R28 on the front axle and 710/70 R42 on the rear axle showed a much better tyre wear behaviour in comparison to the competitive reference tyre in the same tyre size from another premium tyre manufacturer through the whole test. Furthermore the total lifetime of the “Traxion XXL” is very positive, especially on the front axle, which is more heavily loaded with shear forces in cornering. In comparison to the tyre from the reference manufacturer the Vredestein tyre has a better lifetime of 87%

on the front axle. The test result also confirms a better result on the rear axle with a higher lifetime of 51%. Because of the recorded result the total cost of ownership per operational hour will be lower in comparison with the reference product. Based on the assumed purchase prices in combination with the lower cost per operational hour an economic advantage is also obvious. The tyre replacement frequency will be lower and therefore not only the cost-performance ratio but also the environmental sustainability of the Vredestein “Traxion XXL” is essentially better.

Further information

Testing agency

DLG TestService GmbH, Gross-Umstadt location, Germany

The tests are conducted on behalf of DLG e.V.

Department

Fahrzeugtechnik

Head of Department

Dipl.-Ing. (FH) Andreas Ai

Test engineer(s)

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DLG – the open network and professional voice

Founded in 1885 by the German engineer Max Eyth, DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society) is an expert organisation in the fields of agriculture, agribusiness and the food sector. Its mission is to promote progress through the transfer of knowledge, quality standards and technology. As such, DLG is an open network and acts as the professional voice of the agricultural, agribusiness and food sectors.

As one of the leading organisations in the agricultural and food market, DLG organises international trade fairs and events in the specialist areas of crop production, animal husbandry, machinery and equipment for farming and forestry work as well as energy supply and food technology. DLG's quality tests for food, agricultural equipment and farm inputs are highly acclaimed around the world.

For more than 130 years, our mission has also been to promote dialogue between academia, farmers and

the general public across disciplines and national borders. As an open and independent organisation, our network of experts collaborate with farmers, academics, consultants, policymakers and specialists in administration in the development of future-proof solutions for the challenges facing the agriculture and the food industry.

Leaders in the testing of agricultural equipment and input products

The DLG Test Center Technology and Farm Inputs and its test methods, test profiles and quality seals hold a leading position in testing and certifying equipment and inputs for the agricultural industry. Our test methods and test profiles are developed by an independent and impartial commission to simulate in-field applications of the products. All tests are carried out using state-of-the-art measuring and test methods applying also international standards.

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