

HEAVY

NOKIAN HEAVY TYRES' CUSTOMER MAGAZINE



LEGENDARY

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WHEEL OF A TRACTOR

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nokian
HEAVY TYRES

LONG FIELDS, LONG DAYS

➤ Sometimes you have to put in extremely long working hours, especially in the hay-making season. This fact is very familiar to Fokko Janssen, who works in the contracting business owned by his brother Johann Janssen.

Fokko Janssen drives a Fendt 936 Vario with a hefty 360 hp. Such strong power is needed to transport the kinds of loads the contractors haul. The Fendt pulls a Bergmann HTW 65 Vario Six forage trailer that fits loads as big as 65 cubic metres. This combination is very demanding on the tyres. The tyres must offer good driving properties both on the road and in the field, and they must be as gentle on the field surface as possible.

“Running a contracting business, we must be able to rely on our tools. Stoppages are simply not an option,” says Johann Janssen. He started the company in 1995, and today it employs 12 people.

The company is based in Aurich, in the East Friesland district, Germany, near the North Sea coast. Typical forage crops in this region are hay and corn. The feed has traditionally been consumed by milk cows in the region, but nowadays an increasing proportion goes to biogas power plants generating heat and electricity. Currently, there are approximately 1,000 biogas power plants in the Lower Saxony state, to which East Friesland also belongs. Contractor Janssen also has his own power plant with an output of 500 kW.



BEHIND THE WHEEL	Fokko Janssen
WHERE	Aurich, northern Germany
WHAT	Agriculture contracting
MACHINE	Fendt 936 Vario
FORAGE TRAILER	Bergmann HTW 65 Vario Six
TYRES	Nokian Country King 710/50 R 26.5





Appreciated by customers, good for the environment

We asked Product Development Manager Martti Päivinen about the most important environmental factors taken into account in Nokian Heavy Tyres' product development.

The features appreciated by customers are also good for the environment: the lighter the tyre rolls, the lower the fuel consumption and, consequently, the lower the overall operating costs. Thanks to a low contact pressure, the tyre is gentle on the terrain and saves bottom flora. The rubber compounds, treads and structures of our special tyres are thoroughly tested and designed to withstand extreme wear and tear. This extends the tyre's service life and reduces waste.

What are the key trends in product development?

Product development is constantly seeking new, creative ideas. Environmental friendliness will be an integral part of our work in the future, as well. We aim to further lower the rolling resistance of our tyres by exploring new materials and optimising rubber strengths. Moreover, we are continuously developing our production methods to be safer, more efficient and environmentally friendly. The further development of the Beyond All-Steel Radial technology is also an interesting, important task. Read more about this interesting technology on page 13 of this magazine.

We are passionate about developing even more functional solutions and tools for forest, field, road, terminal and mine work. Relying on our persistence and creativity, we can ensure you safe and efficient work. We provide flexible service in all cases to help you achieve your goals.

Nokian heavy tyres are sold in both the OE and replacement markets. The company works in close co-operation with original equipment manufacturers. Nokian Heavy Tyres Ltd. is part of the Nokian Tyres Group.

NOKIAN HEAVY TYRES is one of the world's leading manufacturers of special tyres. Its key product segment is forestry tyres. Other important products are special tyres for agricultural machinery and a variety of industrial machine tyres.

What makes Nokian Heavy Tyres unique is its familiarity with extreme driving conditions and its respect for nature. We also lead a continuous, close dialogue with our customers.



HEAVY
Nokian Heavy Tyres
customer magazine

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No use re-inventing the wheel

...but why not make it spin in new ways! Creative ideas can add efficiency and improve the outcome of your work – and brainstorming is refreshing.



Wheel – the simple yet ingenious invention that has helped shape our history over thousands of years. The wheel allows a vehicle or load to move freely on a surface. The ancient Sumerians were, assumedly, the first to put wheels on carriages. They were known to use four-wheeled carriages pulled by horses around 2,500 b.C. Air-inflated tyres were first used in bicycles in the late 19th century. They provided a better grip of the road and enhanced driving comfort, which is why they soon expanded to other vehicles as well. What would a heavy-duty machine without tyres be like?

ARTISTS can hover around and be creative. Forestry machine operators have no time for creativity!

Or do they?

YES! Creativity is not about mystique or magic. It's about thinking in a new way.

We are all creative whenever we come up with new ideas.

Even in the cockpit of a heavy-duty machine.

When planning a contract.

When servicing machines.

"To prevent your tools from rusting, you can put a piece of chalk in your toolkit. Chalk absorbs moisture." (Niksi-Pirkka - a magazine's reader tip column)

Can you solve this: *

Continue the sequence with the numbers 1, 5, 7 and 9 in the right order.

8,2,3,6,4....



YOU CAN BE CREATIVE about packing your lunch.

"To keep your lunch cool on a hot summer day, put your drink bottle in the freezer overnight and then place it in the box." (Niksi-Pirkka - a magazine's reader tip column)

All it takes is some brain activity. And not giving up. Creativity is an endurance activity. You can be creative as long as you don't give up.

Would you like to try a creative, manly sport?

Finns are famous for their crazy creativity that has resulted in such hilarious summer games as:

- Summer ice fishing. Take a plate of polystyrene and saw a hole in it. Put the plate floating on water and go fishing!
- Crawling on all fours in solid snow. It has been calculated that crawling on all fours in solid snow for a distance of 500 metres corresponds to a 10-kilometre run.
- Wife carrying. Pick up the missus and run!
- Sauna bathing. Who can withstand the hottest heat for the longest time?
- Iron bar walking – the manly man's version of Nordic walking.



* People usually think this is a mathematical task. However, this time the task is to put the numbers in alphabetical order!



KEEP GOING, KEEP GOING!

When you can no longer keep going, let it be. Creativity can flourish even - and especially - in your free time. When your mind is at rest, the pieces may snap into place just like that.

Fishing is relaxing and mind-stimulating.

"On fishing trips, the hooks of your lures often get tangled with something during transportation. You can easily protect your small lures by placing them into empty vitamin boxes, and the packages of effervescent tablets are great for big, narrow lures. This way, you may be reeling in your first catch while your fishing buddy is still attaching the lure!" (Niksi-Pirkka - a magazine's reader tip column)

There is room for creativity in making firewood.

"When I start chopping firewood, I place a wheelbarrow on both sides of the chopping block. The chopped pieces of wood fly directly into the barrows and can then be easily rolled to their place of storage. This way, you don't need to bend down to pick up wood at all." (Niksi-Pirkka - a magazine's reader tip column)



On your journey towards Destination: Great Idea, you often pass by the Valley of Discouragement, Blunder Hill and Mediocre City. Make sure not to get off the train at those stops!

Don't alight at intermediate stops.
Go all the way!

Failure is not failure - it is a sign telling you that you must do something differently.

Significant inventors:

- Thomas Alva Edison is primarily known as the inventor of the light bulb, but he registered over one thousand other patents as well.
- Nikola Tesla invented, among other things, the alternating current, the polyphase system and the induction motor, all of which have had a decisive impact on the modern distribution and usage of electrical power.
- Leonardo da Vinci can be modestly characterised as a scientist, mathematician, engineer, inventor, anatomist, painter, sculptor, architect, botanist, musician, and author - in a word, creative!

"Thinking costs you nothing but not thinking costs you immensely." Mertz Bergman

"EVERYTHING HAS ALREADY BEEN INVENTED."

In the 1870s, Bishop Milton Wright was convinced that everything worth inventing had already been invented. When someone told him that humans would learn to fly one day, he insisted that flying is for angels only. In 1903, Orville and Wilbur Wright completed the first engine-powered flight on an aeroplane they had invented. Did you know that they were Milton Wright's sons?

SOMETIMES, PARENTS HAVE A FUNNY WAY OF DIMINISHING THEIR CHILDREN'S CREATIVE IDEAS.

"When I was six, I almost invented a blowing machine. It included screws, a drain lock, electrical wires and insulating tape that I had found in dad's toolbox. Then Mom just told me that no such machine could exist," writes Mertz Bergman in the book Luovan ajattelun hakusanat ("Search words for creative thinking").

Of course, creative ideas sometimes get laughed at. Laugh back at them! Laughing is relaxing, and maybe your relaxed mind will come up with an even better idea.

✍️ Katri Syväriinen ✍️ Ville Pirinen

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- Niksi-Pirkka (a magazine's reader tip column)



Nordman now also available for container handling machines

The Nokian Nordman tyre range was expanded for this summer with the launch of new models designed for container handling machines. In addition, Nordman tyres suitable for underground mine loaders will be available shortly.

The sturdy Nokian Nordman Harbour is a cross-ply tyre designed for reach stackers, forklifts and RTGs. The new Nordman RTG product features a tread design optimised for RTG cranes.

The development of the Nordman product family was initiated a few years ago. Nokian Heavy Tyres wanted to offer an alternative that has an excellent price-quality ratio but not the full range of premium tyres' special properties.

"We responded to our customers' wishes

by first developing the Nordman forestry tyre that was launched last year. It is a good, well-functioning special product," describes Vesa Sampakoski, Sales and Marketing Manager, Nokian Heavy Tyres.

"The Nokian Nordman product family is particularly suitable for replacement markets, for example, on overhauled machines, but the products are also bought as original equipment tyres. Of course, reliability is the top priority. The customer's expectations are met."

Most of the Nordman products are intended for similar machines as premium products. In addition, new Nordman tyres are currently under development that will expand the existing product family to all-new applications. ■

Nokian Nordman Harbour

- Sturdy, stable cross-ply structure
- Good price/quality ratio
- Designed for reach stackers, counterbalance forklifts and RTG harbour cranes

Nokian Nordman RTG

- Thanks to the round tread, it's easier for a massive machine to turn its wheels
- Good price/quality ratio
- Designed for RTG harbour cranes.



winter properties, the block-patterned Nokian TRI 2 proved to have the best traction on packed snow, regardless of the tyre pressure, outperforming four rib-patterned tyres. It demonstrated 15 percent better traction than the best rib-patterned tyre. Reducing tyre pressure to the lowest recommended level even further enhanced its traction ability. The test drives were performed in a temperature of approximately 15 degrees Celsius below zero, and some of them were driven at night in order to minimise the impact of daily temperature variation on grip properties. The test was conducted by MTT Vakola (Institute of Agricultural Engineering Finland), Valtra and Koneviesti, independent technical magazine for contractors in Finland.

Success in tests

Nokian ELS Radial is economical with fuel

The Nokian ELS Radial performed very well in a flotation tyres' fuel consumption test conducted in Finland. Two models of the Nokian ELS Radial were included in the test, along with three competing radial tyres. When setting the relative fuel consumption of the Nokian ELS Radial at 100 percent, the corresponding figures for the competing products were as high as 101, 103 and 109 percent. In an annual working time of 2,000

hours, the tested radial competitors consume 400, 1,200 and 3,200 litres more fuel than the Nokian ELS Radial tyres. In terms of annual costs as per the Finnish price levels, the competing tyres generated costs of 600, 1,800 and 4,800 euros higher than the Nokian ELS. The test was conducted by MTT Agrifood Research Finland.

Nokian TRI 2 had the best grip on packed snow

In the Koneviesti magazine's test of tractor tyres'

Nokian Forest Rider won a surface pressure test

The radial Nokian Forest Rider won a forestry tyres' surface pressure test in Germany. With the lowest surface pressure and widest contact patch, the Forest Rider proved to be gentler on the forest terrain than traditional cross-ply tyres. The Nokian Nordman Forest took second place in the test, and third place went to a competitor product, Trelleborg T-422. The test was conducted by University of Göttingen. ■



Technical manual online

Nokian Heavy Tyres has produced technical manuals in different formats since the 1980s. The problem with the printed versions is that information becomes quickly outdated.

At the beginning of this year, the first electronic technical manual was posted on the internet. It can be easily updated whenever new products are launched and additional information becomes available.

The customer can refer to the technical manual for detailed information about tyres, accessories and the special requirements pertaining to each product category. The manual has separate sections for forestry, agriculture, material handling, mining, earthmoving and road maintenance, as well as for multi-purpose tyres. In addition, there is information about special applications.

The manual contains a comprehensive description of each tyre model's technical details. It also provides the correct tyre pressure for different tyres with different loads, speeds and terrains.

"Given the global nature of our operations, an online manual is very practical. We can quickly update new information and have it immediately available. The site is not only an important service for our customers but also a good source of information for our own staff," points out Mikko Pukkila, Manager, NHT Technical Customer Service.

"The technical manual is never completed; it is continuously revised, and we welcome all tips about possible new contents." ■

» Technical manual of Nokian Heavy Tyres products www.nokianheavytyres.com/technical-manual-int



Pressure information with the forestry machine

The pressures recommended for forestry tyres vary greatly, depending on the make of the machine on which they are used. The optimal tyre pressure is, naturally, determined on the basis of the weight of the machine.

Nokian Heavy Tyres is currently preparing a manual that covers the pressures of all of its forestry tyre models with each machine make and model. The aim is to have the A5-sized recommendation manual delivered with the machine as soon as it enters the market after manufacturing.

"Further development will result in model-specific sticker labels that can be attached to each machine already on the production line, like safety regulation labels. We have discussed this with all machine manufacturers, and they have given us the green light to proceed," says Teemu Vainionpää, Project Manager, Product Development, Nokian Heavy Tyres. ■

Information systems boosted – for the customer

Nokian Heavy Tyres is implementing several information system development projects that aim at enabling even faster, more versatile customer service.

Sales Planning Manager **Päivi Tuominen** wants to particularly mention the Product Tool Box:

“The Tool Box contains various kinds of product information that can be accessed using customer-specific login IDs. In addition, customers can see new products that will be taken into the selection, as well as those that will be withdrawn from sales, for example, within six months,” Tuominen explains.

The company’s ERP system is also being updated. According to Tuominen, it will be upgraded to a newer version that enables quicker responses to customers’ delivery time queries, among other things.

In addition, an Extranet pilot project dealing with e-commerce is underway with an importer.

The electronic technical manual that was released online will also enhance customers’ access to information. There is a direct link to the manual on Nokian Heavy Tyres’ website. ■



Sales Planning Manager **Päivi Tuominen** tells us that the Product Tool Box offers many kinds of product information to customers.



New movie star: BEYOND ALL-STEEL RADIAL

High speed, excitement and dangerous situations make for a good action movie, but in a machine operator’s everyday work, excess action is not desired. For a steady, reliable and extremely comfortable course of events, the best choice for the leading role is the revolutionary Beyond All-Steel Radial technology. Its performance stems from top-standard material development and solid expertise in developing tyres for extreme conditions.

Go to Nokian Heavy Tyres’ website to see a movie that illustrates the seminal structure and superior abilities of Beyond All-Steel Radial.

Beyond All-Steel Radial combines the best properties of radial and cross-ply tyres. Instead of the traditional All-Steel solution of using one steel cord, the new tyres feature extremely durable yet light crossed textile chords that enable high load-bearing capacity and very low rolling resistance.

Layered, highly tensile circumferential steel belts give the tyre diametrical stability and keep it in its optimal shape while it is under high pressure.

It has already been proven that tyres featuring this modern technology can challenge and even replace the traditional All-Steel tyres. The Nokian HTS Straddle designed for straddle carriers, with marketleading wear resistance, is already a viable option for traditional harbour tyres. This is a movie you don’t want to miss! And there are sequels coming up... ■

» See the video online at www.nokianheavytyres.com/beyond-all-steel-int



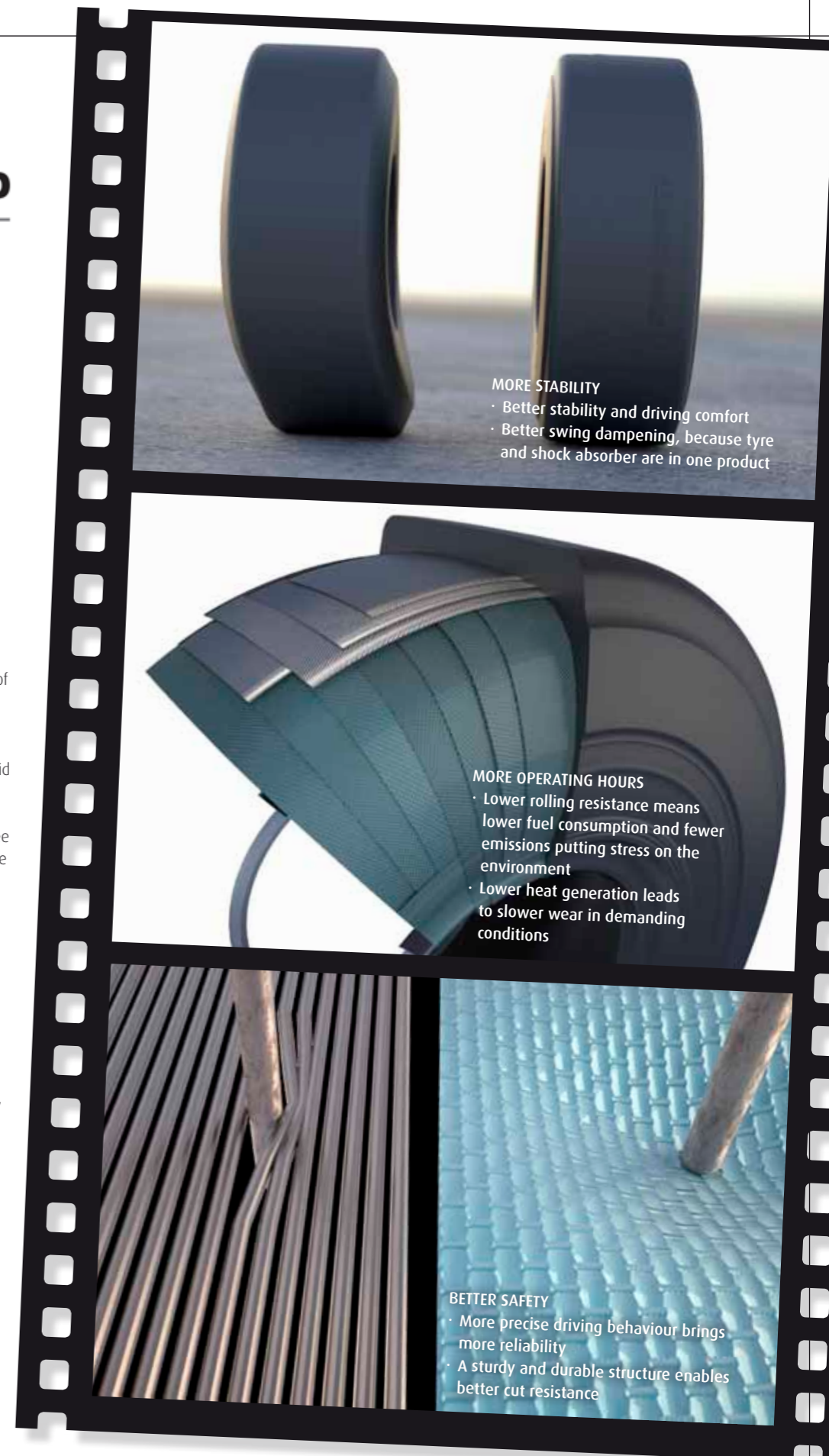
The world’s fastest in extreme conditions

Nokian Tyres’ test driver **Janne Laitinen** set the new ice driving world record on the ice of the Gulf of Bothnia in Oulu in March. The record was added to the Guinness Book of Records.

The car achieved a top speed of 331.610 kilometres per hour on studded Nokian Hakkapeliitta 7 tyres (255/35R 20 97 T XL). At such speeds, the role of tyres is extremely important. They are under immense pressure, which means that their structural durability must be uncompromised. In addition, the increased air drag requires supreme grip.

Searching for boundaries in extreme conditions is a way for Nokian Tyres to acquire new knowledge. The challenging test drives set the bar even higher for product development. ■

» See how the world record was set www.nokiantyres.com/fastest-on-ice



MORE STABILITY

- Better stability and driving comfort
- Better swing dampening, because tyre and shock absorber are in one product

MORE OPERATING HOURS

- Lower rolling resistance means lower fuel consumption and fewer emissions putting stress on the environment
- Lower heat generation leads to slower wear in demanding conditions

BETTER SAFETY

- More precise driving behaviour brings more reliability
- A sturdy and durable structure enables better cut resistance

A German farmer may not harvest his hay himself. Many outdoor tasks from sowing to harvesting and plant protection can be outsourced.



German farms seek growth through new practices

Agricultural supply chains are getting longer. For example, a German farmer can purchase harvesting services from an external contractor, who in turn leases a tractor from a machinery rental company. Businesses apply creative means to adjust to the rapidly moving development trends.



Cows and biogas. These two words crystallise the agriculture of the North Sea coastal towns of Aurich, Leer, Wittmund and Emden in northeastern Germany. Milk cows have been a secure source of livelihood in this region, abundant with large grassy fields with wet, unnutritious soil.

New biogas power plants are continuously established in the region to supplement the existing wind and solar power plants. In its aspiration to significantly promote the generation of renewable energy, Germany guarantees fixed sales prices for ecological electricity suppliers.

This is all like a gift for agricultural contractors such as **Johann Janssen** from Aurich-Walle. His house, barn and workshop have been powered and heated with clean energy from his own biogas power plant since 2007. He has had an Enercon E40 windmill at his farm since 1994, and additional clean electricity is now also generated by the solar panels installed on the roofs of his henhouses.

The German legislation favouring

renewable energy sources benefits Janssen, not only as an energy generator but also as a service provider. In the mid-1990s, this former dairy farmer decided to expand his business with services instead of increasing his cattle, because there were already 11 dairy farms in Aurich-Walle. He gave up animal husbandry altogether and built a biogas power plant. The material harvesting technology used for running the power plant is also offered to colleagues as an outsourcing service.

Cattle farms growing in size

Johann Janssen runs his contracting business according to the commonly applied farmers' basic principle: "The farmer focuses all available resources on tending the cattle, and a contractor is in charge of all outdoor tasks." In the past, farmers took care of all tasks themselves, but the modern farmer outsources an increasing number of tasks. This development trend is spreading at an accelerated pace. In Walle, the average farm has 80 milk cows.

Janssen's company has ten permanent

employees and three apprentice trainees. There is enough work for all of them nearly all year round. A total of 70 percent of Janssen's customers produce corn which is supplied to biogas power plants as raw material.

Hay and corn harvesting are the main services of Janssen's company, but it also offers grain sowing and harvesting, plant protection, slurry and fermentation waste removal from biogas power plants, as well as soil processing services. Moreover, Janssen's service range includes hay baling; most bales are exported to the neighbouring country, the Netherlands. The company is also active in the field of land construction. Janssen is continuously looking for new business ideas with a creative mindset.

Contractors need reliable tools

Depending on the season, Janssen uses 10-20 tractors as well as harvesters, trailers and other equipment. Most of his slurry tanks and harvesting trailers are equipped with Nokian tyres. His fleet contains a total of some 60 vehicles. A service provider must



Janssen's contracting business employs ten people nearly all year round. Future prospects look promising as well, since client farms are growing in size.

Tractor leasing increases flexibility in farming

It all started with two Fendt 515 tractors. With this machine base, Heiko Abel started his agricultural machine rental business called *AH-Agrarmaschinenvermietung* in Wildeshausen, near Bremen in northern Germany in 1999.

Heiko Abel has a degree in information science. Looking for new fields of business, he accidentally came across the farming industry. He started thinking that almost anything could be leased – why not agricultural machinery as well. This idea was backed by the fact that many farms use their tractors less than the 800 hours per year, which is the estimated limit of financial profitability. In major farming businesses, some tractors are only needed during the busiest peak seasons, which add up to a relatively small number of hours per year.

No need to worry about old machinery

Tractor leasing helps businesses reinforce their liquidity and avoid unreasonable burdening of their equity. Moreover, a leased machine is an easier choice for the farm owner, because it can be simply returned to the rental company instead of worrying about selling it on.

Nowadays, Abel's machine rental covers all of Europe, from Norway to the Netherlands, Austria, Czech Republic and Romania. In addition to farm owners, his customer base includes two contractors who have a priority reservation to lease the machines whenever they are not tied elsewhere. One of these contractors is Johann Janssen.

Abel's fleet contains approximately 40 tractors and 40 special machines such as self-propelled machines and trailers. Nowadays, only the most powerful tractor models are leased. The most popular ones are the Fendt models 820–936 Vario and three Claas-Xerions.

"Leasing is beneficial for farmers in many ways: They can accurately define the immediate costs of the task at hand, and they get exactly the right size of tractor for it. In addition, these machines are always state-of-the-art, and they enable better preparation for busy workload peaks, such as rainy periods in the harvesting season, when you must utilise your machine to the fullest," Abel explains.

Usually, each machine is used by three



Three years ago, Johann Janssen decided to start leasing the tractors and work machinery of his contracting business, and he hasn't regretted his decision. The fleet contains approximately 60 vehicles.

different customers. In the summertime, the tractors are on the field, and in the winter, they are used on construction sites. Every machine is utilised for an average of 1,200 hours per year.

All leased machines are equipped with GPS, which enables tracking their location over the Internet in real time whenever necessary.

Contrary to common belief, people take good care of leased machinery. The tractors are always taken to the workshop for a thorough going-over before handing them over to a new customer.

"Our machines would be ready for vehicle inspection on any day."

The machines are usually leased on a monthly basis, and the rent is based on a certain number of hours. After six years or 8,000–10,000 hours of use, the machines are discarded.

In machine acquisition, Abel emphasises continuity. He purchases nearly all machines from the agricultural machinery dealer Schröder in Wildeshausen, and he also has his machines serviced and repaired there.

Bright future prospects

For the past four years, Abel has equipped all of his dump trucks and grass forage trailers with Nokian tyres. He experienced some quality problems with his previous tyre supplier's products, which led to disputes with the manufacturer. Abel finds Nokian tyres to be a good choice, particularly for major contracting companies that must cover increasing distances, because Nokian tyres have good road driving properties and enable speeds up to 60 km/h. On the other hand, field work requires low contact pressure; therefore, half of the tyres are equipped with pressure regulators made by PTG of Germany.

Heiko Abel has bright future prospects. Companies are growing and joint ventures and biogas power plants are being established. This means an increasing demand for heavy machinery that requires a lot of capital but is used on a short-term basis which, in turn, creates an ideal operating environment for machine rental. ■



Johann Janssen has noticed the shortening development cycles in the agricultural business.

Johann Janssen has noticed the shortening development cycles; new purchases are needed more frequently than ten years ago. This means that the contractor must continuously develop new ideas.

Three years ago, Janssen made radical changes to his machine acquisition principles. The second-hand machinery market plunged once again, which meant that when purchasing new machines, the old ones had to be sold with considerable losses. Janssen decided to start leasing machinery and found an ideal partner for this: Heiko Abel's agricultural machine rental company. This has proven to be a very good decision.

"Everything works flawlessly, I have no complaints whatsoever. The most positive thing is that I no longer need to worry about selling my old machinery; I can focus on my own business."

The future does not worry Janssen.

"New biogas plants are established in the region, and the dairy farms keep getting bigger. There will definitely be work for me for the years to come." ■



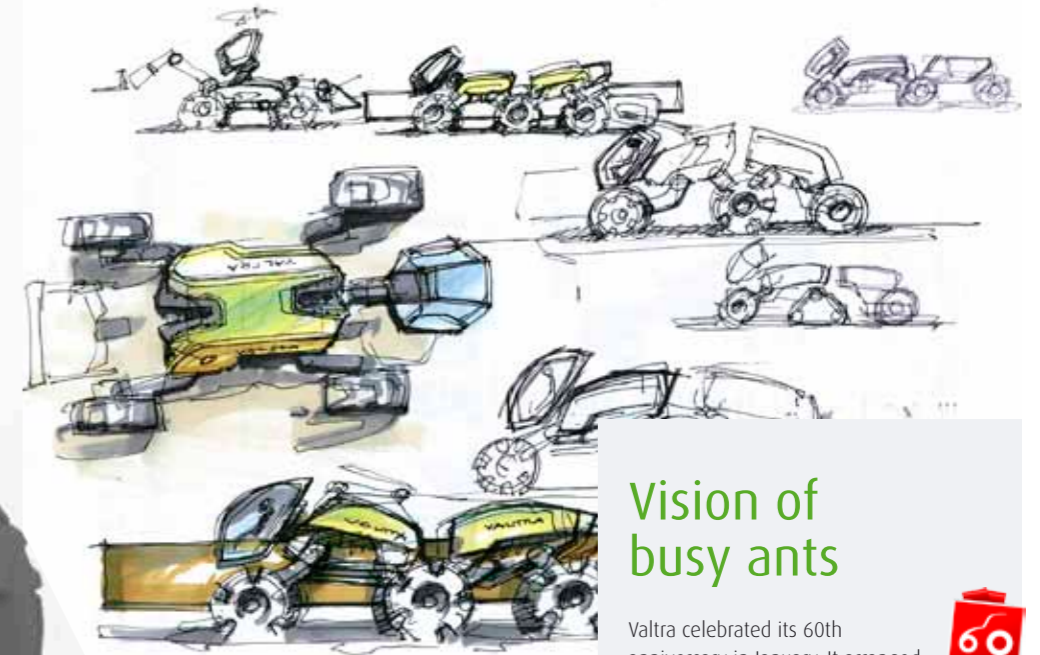
At Johann Janssen's farm, new business opportunities have been found in contracting services as well as biogas production. The farm also has a poultry house.

Christian Mühlhausen



Technology, fuel and tyres facing challenges

Future, here we come!



Vision of busy ants



Valtra celebrated its 60th anniversary in January. It arranged a future-bound seminar in which experts presented their views of farming in the changing world.

In the future, farmers and contractors will need versatile, light, yet powerful machines that are suitable for more demanding tasks than traditional tractors to maximise the efficiency of farm operations.

The highlight of the seminar was the new future vision presentation. Valtra's vision of the future development of heavy-duty machinery is captured in a concept entitled ANTS. The letters A, N, T and S come from Valtra's current product series, but the homonym is nevertheless intentional:

"Farmers will need hard-working ants, as well as advanced technology, in order to feed a growing population with the decreasing cultivation area. The ANTS concept is our response to future challenges," explains **Pekka Ingalsuo**, Manager, Product Management.

ANTS is a modular solution: it consists of the 'soldier' with a power of 100 kW and the 200-kW 'worker'. Both machines can work together or independently. The work is controlled from a cockpit that can be attached to either of the two machines. For heavier tasks that require the human operator's presence, the modules are connected to each other by switching the rear wheels to the narrow track, driving the other machine's front wheels to their level and coupling the machines. This makes a queen with centre pivot steering and a maximum power of 400 kW.



"There will never be enough energy to let it go to waste. The structure and transmission of tractors and other heavy-duty machines must account for the development," says Pekka Ingalsuo, Manager, Product Management, Valtra.

The future development of heavy machinery is steered by increasing efficiency and saving energy and fuel.

Future machinery technology will feature radically different sources of energy and emphasise energy savings. Even though alternative sources of energy have been discovered, there will never be enough energy to let it go to waste. The structure and transmission of tractors and other heavy-duty machines must account for this development.

In addition, general efficiency requirements will increase.

"One of the few invariable – and, consequently, limiting – factors is the fact that there are exactly 24 hours in a day. Increasing outputs and results are required within this framework, albeit that some future researchers

talk about slow motion and other such movements," says **Pekka Ingalsuo**, Manager, Product Management from Valtra.

Developing fuels, increasing electrical operation

There is a lot of talk about new energy sources, but their feasibility varies depending on the time span. In the near future, the kind of engine technology we know today will still prevail.

"Diesel will be replaced with another fuel, first partially and later entirely. A gaseous fuel, i.e. a combination of diesel and a gas, is a fully realistic concept," Ingalsuo tells us.

Cars are already fuelled by a mix of petrol

and alcohol. A similar combination can also be implemented for diesel fuels by replacing part of the oil with alcohol. At Valtra, research into this field is concentrated in South Africa, where the company has extensive operations.

"We are studying the use of sugar cane-based alcohol as a component in diesel fuel. There are other alternatives, as well, but in the short term, we put our strongest faith in so-called dual fuel concepts," Ingalsuo explains.

The technology deployed in heavy-duty machines evolves quickly. Ingalsuo has a clear vision about this development.

"Electronic transmission will gain ground. The auxiliary equipment that today is mainly based on belts or hydraulics will be increasingly electronic in the future. In addition, there are strong trends towards increased electronic operation in main transmission, i.e. transferring power to wheels and take-off axles.

In a few years, we will see drastic growth in various telemetric and remote control systems

and autopilots. Commercial applications are already in place, and new ones are introduced on the markets all the time."

Rolling resistance must be further decreased

An array of requirements is also placed on tyres. Regardless of the fuel generating the power, it is the tyres that must convert it into traction.

"Future tyres must provide firm grip and good driving properties in all conditions, because driving speeds will increase," Ingalsuo says.

Further development focusing on energy consumption is still needed.

"We will need solutions that better optimise rolling resistance in transition driving than today's tyres.

According to Valtra's future concept, the tyre will narrow and feature a more even tread pattern when driving on a road, which naturally lowers its rolling resistance. When driving on a field, the tyre should be spread out using some

kind of a mechanism in order to reduce contact pressure and increase traction grip.

"I am rather convinced that something like this will be required in the future. The current trend is that tyres keep getting bigger and wider, which is helpful on the field but a bad direction for on-road driving."

In many countries, fields are widely spread and transition distances are long, and the amount of transition driving will not decrease in the future. Moreover, driving speeds have increased and tractors have become more powerful.

"Tractors are used for an increasing range of public utility services, goods transportation and many other such tasks. This will also mean increasing transition driving and, consequently, further underline the significance of rolling resistance." ■

✍ Jorma Yrjölä 📷 Valtra

HEAVY DOCTOR

In many environments, tracks are valuable assistants for forestry tyres. However, the tyre and tracks must be suited to function well together.

Seamless co-operation between tracks and forestry tyres

What is the right tyre pressure to have with tracks?

The tyre's maximum pressure is the one to use with tracks.

For Nokian Heavy Tyres' products, the maximum pressure is indicated in the technical brochures and on our website. As a rule of thumb, it can be said that the maximum pressure for cut-to-length (CTL) machines' 20 PR tyres (rim sizes 22.5", 24.5" and 26.5") is 550 kPa and for 16PR tyres, 460 kPa. These are the maximum

safety limits that must not be exceeded.

What if the tyre pressure is too low?

If the tyre pressure is below the recommended maximum pressure, the side link of the track tends to penetrate the tyre, for example, when driving over rocks. If the tyre body is twisted into an unnatural position (as in the picture), this may damage the sidewalls and even cause tears in the fabric structure.

The right tyre pressure is particularly



important when using tracks with a side link (see picture). Seasonal temperature compensation should, therefore, also be taken into account.

Low tyre pressure has a major impact on the service life of the tube. Continuous abrasion takes place between the tyre and tube, because the tyre sidewalls give in when rolling under a load. The lower the tyre pressure in proportion to the load, the heavier this abrasion is. In practice, this means that the tube wears, i.e. becomes thinner, and starts to leak air between the tyre and tube. Low tyre pressure with tracks increases abrasion between the tyre and tube and, consequently, shortens the tube's service life.

How to choose suitable tracks

There are different tracks intended for different

purposes: rocky terrain, soft or snowy conditions. In addition, track versions vary according to the size and traction power of the machine. In general, tracks are divided into flotation and traction tracks. Flotation tracks facilitate movement in soft terrain, whereas the more open traction tracks, as the name suggests, increase traction. Turn to the track manufacturer to find the right tracks for your particular usage.

It is essential that the tracks are designed for the tyres you are using. You must also bear this in mind when changing tyres while the old tracks are still operational. Check with the track manufacturer to ensure that your tracks are also compatible with the new tyres.

Critical factors in track suitability are the correct grouzer shape and the correct clearance

between the tyre and side link, which, however, varies between track manufacturers. In general, a clearance of 5 – 15 mm is good. If the clearance is too big, the track can move laterally across the tyre tread, which may damage the tyre or contact the machine body.

On the other hand, if the clearance is too small, it may damage the shoulder area of the tyre. In ground contact, the side link is pushed deep into the tyre sidewall, which may even damage the tyre body. The damages caused by too narrow tracks can be seen in the form of quickly worn tyre shoulders. ■



Tread designs for use with tracks

The Nokian Forest King F tread pattern is designed with track use in mind. There is a special track support in the middle of the tread that provides the track grouzer with optimal grip without damaging the tyre surface. The wide rib combined with slightly reduced groove depth protects the tyre well. In addition, the tyre shoulder is specially designed for maximised protection against wear caused by tracks. The Forest King F is available with a cross-ply structure, and it has proven to be an excellent tyre to use with tracks over the years.

The Nokian Forest Rider tread design is more open than the F design. The open tread

design, with deeper grooves, combined with the radial structure provide superior traction without tracks. The radial Forest Rider can also be used with tracks. Thanks to the radial structure and open tread design, it offers the special advantage of good cleaning in muddy and snowy conditions when used with tracks; the open tread design and pumping motion of the radial structure clean the tyre surface efficiently.

Moreover, the straight sidewalls help the tracks stay on the tyre better.

Additional bonds for increased grip

Often the track grouzer includes a special

additional bond link to increase the grip between the track and tyre and prevent the tyre from rotating inside the tracks. When the track becomes worn, this link can also wear down, and additional material can be welded on it to improve grip. However, you must be careful with additional bond links: their dimensions must not exceed those of the original link. It is particularly important to ensure that the length of the link is sufficient so that not all forces are targeted in the middle of the tyre, which may damage its surface and, consequently, reduce its service life.

CLASSIC

Nokian TRI Backhoe – strong grip for backhoe loaders

Tyres used in contracting tasks must be stable and function well in the terrain. They must endure heavy use while also providing comfortable transition driving properties. The Nokian TRI Backhoe was the first block-patterned tyre on the market. The winter grip of this cross-ply product became a concept.

- Better longitudinal and lateral grip than the traditional open-centre tread design, especially in winter conditions.
- Special-structure tyre for backhoe loaders.
- Enables stable work without supporting beams.
- Less "nodding" in on-road driving.

Nokian TRI Backhoe



FUTURE CLASSIC

Nokian TRI 2 Steel – more durable than ever

The newest size in the Nokian TRI 2 product family (250/80 R16) is particularly suitable for small tractors used in facility maintenance and grass field maintenance. The block-patterned, radial Nokian TRI 2 Steel is reinforced with steel belts.

- Versatile and environmentally friendly special tyre designed for the needs of modern farming and machine contracting.
- Excellent grip in the varying targets of facility maintenance especially in winter.
- Thanks to the block pattern and even surface pressure, the tyre is also suitable for working on delicate green areas.
- The tread design and sturdy structure ensure even wearing and extended service life.
- At its best when the machine is simultaneously used for driving and working.
- A comfortable passenger car-like driving response makes highway travel easier and increases traffic safety.

Nokian TRI 2 Steel



World champion took a liking to the sturdy tractor



Four World Rally Championship titles

Tommi Antero Mäkinen (b. 26 June 1964 in Puuppola, Jyväskylä rural municipality, Finland) has won the World Rally Championship four times in 1996–1999. He won 24 of the 139 WRC races he drove. He won the Neste Oil Rally Finland, as well as the Monte Carlo Rally several times in a row.

Mäkinen won the championship titles for the Mitsubishi team. In his career, he had Seppo Harjanne, Risto Mannisenmäki and Kaj Lindström as his co-drivers.

After finishing his rally career in 2003, Mäkinen has focused on running Tommi Mäkinen Racing Oy, as well as his farm and forest estate in Puuppola.



rally car parts and other rally merchandise and organises rally-related adventure events. Tommi Mäkinen Racing also runs a rally team.

"I still travel a lot. The co-operation with Subaru takes me to Japan often, and we have customers all over the world. Who knows where I'll find myself next," Mäkinen says with a laugh.

✍️ Kari Saarinen 📷 Petri Blomqvist

Lots of snow to plough in the winter, large fields to maintain in the summer. Multiple-time World Rally Champion **Tommi Mäkinen** puts the tractor into hard use in his everyday work.

Mäkinen runs his farm in Puuppola, central Finland. The new Valtra Versu T202 with all accessories is his tractor of choice. It has the potential for all kinds of heavy-duty tasks.

"This is a powerful tractor that will not leave me short of capacity. On the other hand, it is also suitable for lighter tasks," says Mäkinen. He knows what he is talking about – in addition to his rally titles, he has also won the Finnish Championship in tractor ploughing in his youth.

"In the winter, the studded, block-patterned Nokian TRI2 are an excellent choice. For the summer, I mount regular tractor tyres for field work."

Valtra has been Mäkinen's partner from the beginning of his rally career. He finished racing

a few years ago, but he still hosts several Valtra events at his farm every year.

The legendary rally driver has a lot going on all the time, but he tells us that he also manages to find time to participate in running his seed grain farm of approximately 100 hectares.

"We also have two Ponsse machines equipped with Nokian tyres to do contracting work for Metsäliitto. They also take care of the farm's forests," Mäkinen says, also noting that he earned the money for his first rally car as a forestry machine operator.

In addition to running his farm, Tommi Mäkinen is also an active businessman in the field of motorsports. His company, Tommi Mäkinen Racing, makes rally cars in co-operation with Subaru of Japan. The company also imports

Nokian Heavy Tyres participates in events in 2011

FINLAND

- Farmari 30 June–2 July, Pori (Vianor)
- Maxpo 8–10 September, Hyvinkää
- KoneAgria 19–22 October, Jyväskylä

SWEDEN

- Maskin Expo 19–21 May, Barkaby Stockholm

SWITZERLAND

- Suisse Public Bern 21–24 June, Beaexpo Bern
- Internationale Forstmesse Luzern 18–21 August, Messe Luzern

CZECH REPUBLIC

- The Day of Forestry Machinery in Kladska 9 June

POLAND

- International Forestry Fair Rogow 7–9 September

AUSTRIA

- Austroforma 11–13 October, Graz Forestree. Austroforma – village, place number 3.
- Hausmesse Forstschule 10–12 October, Ossiach

BULGARIA

- International Technical Fair 26 September – 1 October, Plovdiv

GREAT BRITAIN

- Grassland & Muck Show 18–19 May, Stoneleigh Park, Warwickshire
- Cereals Show 15–16 June Boothby Heath, near Lincoln, Lincolnshire
- Royal Highland Show 23–26 June, Royal Highland Centre, Edinburgh
- Agriscot 16 November, Royal Highland Centre, Edinburgh

SPAIN

- Fendtguinos 6 October, Lleida Catalonia

BELGIUM

- Agribex 6–11 December, Brussels

FRANCE

- SPACE 13–16 September, Rennes
- Salon vert Soud ouest, 21–22 September, Bordeaux
- Sommet de l'élevage 5–7 October, Cournon
- SITEVI 29 November – 1 December, Parc des exos Montpellier
- Paysalia 6–8 December, Lyon

GERMANY

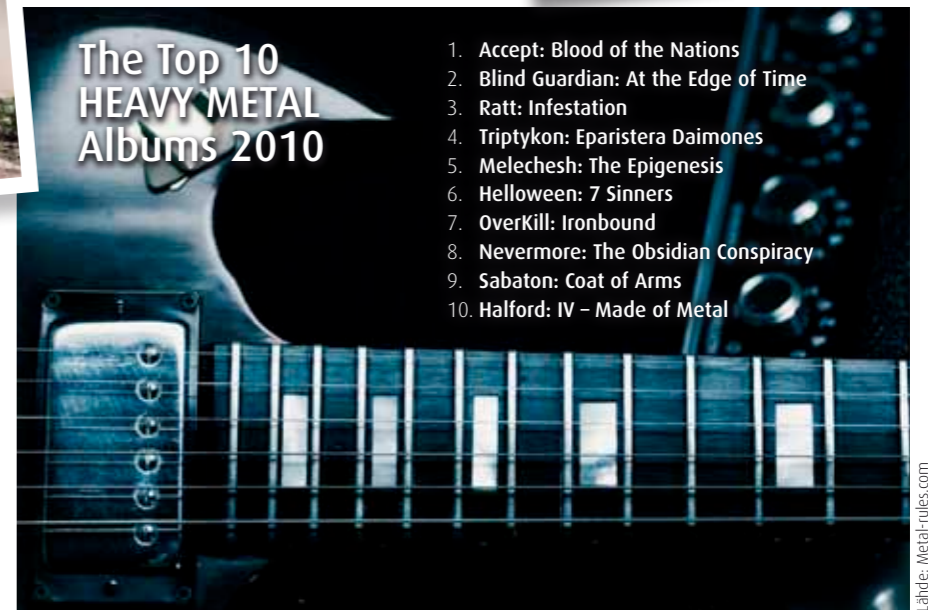
- Demo Park 26.–28.8., Eisenach
- AGRITECHNICA 13.–19.10., Hannover

» More information: www.nokianheavytyres.com/exhibitions-2011

TOMI WON NEW SUMMER TYRES! Everybody who sent feedback on the previous Heavy magazine was automatically entered in a drawing for a set of summer tyres. **Tomi Penttilä** is now driving with new tyres. Congratulations to the winner!

The Top 10 HEAVY METAL Albums 2010

1. Accept: Blood of the Nations
2. Blind Guardian: At the Edge of Time
3. Ratt: Infestation
4. Triptykon: Eparistera Daimones
5. Melechesh: The Epigenesis
6. Helloween: 7 Sinners
7. Overkill: Ironbound
8. Nevermore: The Obsidian Conspiracy
9. Sabaton: Coat of Arms
10. Halford: IV – Made of Metal



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Nokian HTS Straddle

- › Excellent hourly output in demanding conditions. The ultra-durable Beyond All-Steel Radial structure makes handling safe and extremely comfortable



› NEW

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- › A stable special tyre for harbour and terminal equipment; also suitable for sawmills and timberyards

Nokian RTG

- › Easily turning special tyre for RTG's with extremely low rolling resistance

