NEVER DRIVE OVER THE FORAGE AGAIN

100



The future of raking: **RESPIRO**



DI Thomas Reiter, Founder and Managing Director

Cleanest forage

... Never drive over the forage again

With conventional roundabout rake technology, the forage is pushed into the ground in the tractor track, this leads to increased dirt accumulation, raking and crumble losses. With the *RESPIRO* reverse-drive belt rakes, these disadvantages are eliminated because they never drive over the forage again! This is the only way to achieve unique forage quality and fewer losses. Practitioners confirm the outstanding work quality, achieved by the flexible pick-up and the dragging tine. The many positive effects of clean forage create the added value, that makes this technology a highly profitable investment.

www.reiter-respiro.com

LIFTING WITH TRAILING TINES AND SMALL PICK-UP DIAMETER





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Cleanest Forage

Conveyor rotor & swath roller ... 18

Added value & versatility

Sliding disc close to the tine

Flexible pick-up

Anti-Loss-System

Camless pick-up

Small diameter

Trailing tine

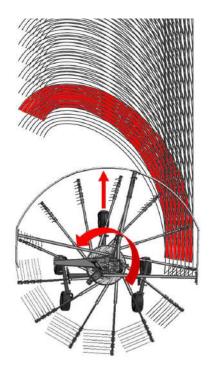
RESPIRO R6 & R7rd

| UNIQUE GROUND HUGGING | Detailed view |
|-----------------------|------------------------------------|
| | Reverse drive & Driving strategies |
| FLEXIBLE PICK-UP | Transport |
| | Soil adaptation |
| | Operation |
| | Data sheet |

Is sweeping with the rotary rake still up to date?

How much longer are we going to go without extracting the full value of the basic fodder?

Inevitable consequences due to contaminated feed!



| | Deficits in performance Compacted / knotted swath Limited working speed Poorer post-drying on the swath Inflexible in working width and depositing direction | Animal health risks Contaminated feed causes inflammation, fertility and hoof problems Less performance Collics in horses |
|---|--|--|
| Picture above: In practice, frequent and aggressive ground contact is unavoidable: Dirt and foreign matter ingress with all the known disadvantages. | Contaminations Dust, soil, sand Stones and foreign objects Unhelpful bacteria and fungi | Losses Leaf loss Crumbling losses Rake losses |
| Picture left: The lines in the picture illustrate the enormous succession of tines when swathing and the long path when sweeping the crop on the ground. | Officiend and funging Slurry / manure residues Mice Rotten undergrass | Hake losses Losses at the feeding fence Wear on machinery |

Never drive over the forage again THIS IS THE NEW WAY.

RESPIRO

exploits the full potential

If you make cleanest forage your top priority, is to move from sweeping to lifting.



Clean forage

Noticeable reduction of all kinds of contamination = best forage quality

Animal Health

Better feed keeps animals healthy, less worry, more success

High performance + flexibility

Loose swath, no twisting, high working speed, full flexibility in working width, left and right delivery possible

Lowest losses

Less leaf loss improve protein content, very little wear

For all uses

Ideally suitable for difficult working conditions

RESPIRO technology creates advantages that



Martin T. Farmer from Regen, Germany (RESPIRO R7rd)

RESPIRO customer since 2021

"The manoeuvrability of the Respiro R7 on the headland and in the corners is convincing. This makes me very powerful. I can also carry the crop out of the corners and move swaths from wet to dry areas."



ADDED VALUE for the farmer

Less forage contamination

► Machine can generally be set higher, as the forage does not have to be scraped out of the ground.

Less crude ash, more energy, more protein → higher milk production
 Better fermentation quality, tastiness → higher feed intake
 Best feed quality ensures animal health → less veterinary costs
 Higher herd age

Lower losses

Less leaf loss, more crude protein - ideal for legumes
Less crumble loss delivers more output from the basic feed
More crop yield per ha due to fewer raking losses
No lying rotting grass

Swath loose, even, perfectly sized

Looser placement, better drying - earlier start of raking possible
 Uniform swath for high performance of the following machine

More benefits

Flexible cleaning out of corners and pointed fields by loading the stopped belt
Protection of the swath
Less wear due to few stones and foreign objects in the forage
No broken tines in the forage
Higher lifetime performance of the machines
Lower repair costs

our customers will never want to do without.



Josef H. Farmer from Pittenhart, Germany (RESPIRO R6rd)

RESPIRO customer since 2019



"On our small plots of land, the machine is very quick and manoeuvrable. It was also crucial for us to reduce the amount of crude ash. The best way to do this is not to drive over the forage at all. The Respiro R6 is an optimal solution for our demanding moorland areas."

ADDED VALUE for the contractor

Less wear

- Lower wear costs on the rake due to passive tines
- Few tine breaks, tines cannot get lost
- Fewer stones and foreign objects less wear and tear less knife grinding in the cutterbars of the following harvesting machines.
- Higher lifetime performance of the machines

Versatile use: utilisation of rake and following chain

- In all fields of application grassland, forage, lucerne, straw swath turning, maize straw, from long horse hay to the short last cut in permanent grassland.
- Repeated overlifting does not result in swath tapping and losses
- High working speed for high area output and performance without loss of quality
- ▶ Fuel savings for the entire harvest chain

Less forage contamination

- Image gain at the customer due to clean forage and thus higher basic forage productivity
- Higher income per hour or hectare
- Fewer failures due to foreign objects in the self-propelled forage harvester, loader wagon or baler

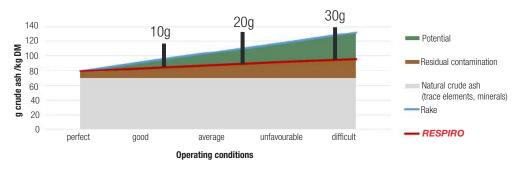


Increase in forage productivity HEALTH, FERTILITY, LIFE PERFORMANCE

The goal: reduction of crude ash content

With the **RESPIRO**, thanks to the flexible pick-up and the trailing tines, a reduction of the crude ash content by up to 40 g/kg DM is possible. Clean forage is the basis for increasing forage productivity. The more difficult the harvesting conditions, the greater the potential for productivity increase through the use of **RESPIRO** technology.

Potential: Reduction of crude ash content with the **RESPIRO** technology



Rule of thumb: Milk production

▶ The reduction of 10 g raw ash/kg DM in the feed increases on average...

- ...the energy concentration (NEL) by about 0.1 MJ/kg DM
- ...the crude protein content (XP) by 1.6 g/kg DM

• Energy requirement of the cow for milk production: 3.17 MJ NEL/kg milk

8 - RESPIRO Belt rake

*Example according to the following assumptions:

Ruben D. Farmer from Niedersachsen, Germany

RESPIRO customer since 2021

"The veterinary costs of our 108 cow herd have decreased by 50 € / cow & year. Milk yield has increased by more than 10 % from 9,600 kg to 10,600 kg / cow & year!"

Daily grass silage intake 16 kg DM/day

Higher feed value

Dirt displaces valuable energy and protein in the feed. If you reduce the amount of dirt, the cow automatically takes in more energy and protein when eating, **thus increasing the amount of milk.**

Additional yield per cow*

- ➔ 0,5 kg milk / day
- → 150 kg milk / year
- → 60 € / cow & year

Savings of 15 kg soy / cow & year = 6 € / cow & year Each cow eats 60 kg less dirt & year !!!!!

PROFIT POTENTIAL*

Higher feed value: 60 € / cow & year + Soy saving: 6 € / cow & year + feed intake 75 € / cow & year

141 € / cow & year



Calculation 100 cow farm

- → 14,100 € additional income / year
 - ➔ 6 tonnes less dirt in the feed



EXAMPLE

Increase feed intake

Clean fodder is tastier, the cows are more energetic due to less dirt in the fodder and this increases their appetite. The daily feed intake increases and so does the amount of milk.

▶ 0.33 kg DM / day higher basic feed intake



→ 75 € / cow & year



Other profitable factors

- Lower veterinary costs
- Fewer worries in the barn
- Higher vitality, higher herd age
- Lower field losses
- Better ensiling, less fermentation losses
- Savings on silage additives
- Less feed loss at the feed table
- and much more...



EXAMPLE

Invest in the right technology now.

It's worth getting started. At any time.



Reduction of costs of the self propelled harvester

- ► Uniform loose swath
 - Chopping speed can be increased up to 30% more output on the same swath
- ▶ Put a larger working width in a swath
 - ▶ Better utilisation of the self propelled harvester
 - ► Lower diesel consumption
- ▶ Fewer passes of the harvesting chain
 - ▸ Less soil compaction



Increasing the area output during swathing

- Driving speeds of up to 25 km/h depending on field conditions with clean, loss-free forage collection
- Quick lifting and exact lowering of the work unit saves time
- ▶ Quick turning on the headland



Wear reduction of the harvesting technology

- Flexible pick-up & trailing tines leave stones & dirt on the ground
- Grind knives less often
- ▶ Wear reduction up to 50%
- Save fuel
- ▶ Reduced risk of damage from foreign objects
- ▶ Reliability of operation

Less crumb loss - more protein in the feed



▶ Increase in crude protein content (XP) by 1% point

Additional yield per ha* -

→ 100 kg more crude protein / ha & year
→ 80 € additional yield / ha & year

Especially for sensitive forage crops with a high leaf content (clover, lucerne), the *RESPIRO* technology is better suited than conventional systems on the market.

The key factors are:

EXAMPLE

- Forage plants are lifted up very gently on the spot and not swept over the whole area
- Small pick-up diameter low barrier, the crop mass is lifted gently
- ► Low tine impact speed protection already starts with the lifting
- Material is transported onto the belt by the rotor: gentle on fodder compared to belt rakes with a large pick-up diameter, where the throwing energy is generated by the high tine speed.

Diversity of use

RESPIRO technology is ideally suited for all applications: Grassland, forage, lucerne, straw, maize straw, from long horse hay to short last cut in permanent grassland



| F | Permanent grassland | Нау | Green rye | Kleegras Clover grass |
|---|---------------------|-------------|-------------|-----------------------|
| | Rape straw | Maize straw | Alfalfa hay | Straw |

Unique The flexible pick-up from Reiter

The flexible pick-up is the heart of the **RESPIRO** belt rake. With pick-up widths of 3 m and more, the pick-up must be flexible so that the ground adaptation works. This is the only way to achieve perfect work result in grassland.

This unique position points the way to the future of belt rakes.



Best raking quality

Even under difficult working conditions, raking losses are low. This not only increases the overall yield but also the forage quality of the subsequent cuts. Top quality - hectare by hectare, cut by cut.

No aggressive ground contact

Due to the flexibility of the pick-up, no aggressive ground contact is possible. This not only creates a good feeling in operation. It is the basis for top forage quality. The sward is also protected, which promotes re-growth.

Little wear on the tines

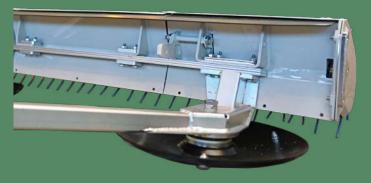
Even forage from deepenings is picked up cleanly and without loss.

The pick-up tines only touch the ground sporadically. This minimises wear on the tines. That's what every practitioner wants.

Due to the unique flexible pick-up in the **RESPIRO**,

we achieve unprecedented ground hugging.

Elastic spine PATENTED



Few tine breaks

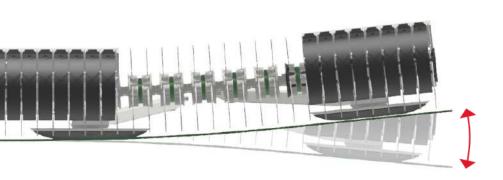
The dragging pick-up tines very rarely touch the ground. The logical consequence is maximum tine life.



The pick-up is divided into several segments - the two middle sliding discs guide the pick-up inside and support the belt body - the two outer sliding discs only guide the outer pick-up segments in height. The elastic spine attached behind the Pick-Up connects the five-part structure of the yokes and keeps the Pick-Up in shape - this enables perfect ground hugging.

Best ground guide Sliding discs close to the

The sliding discs are positioned as close as possible to the tine rake line. They guide the pick-up perfectly over the ground without leaving marks. Punching into the soil is virtually impossible. That is why the Respiro belt rake has no fixed skids.



Free rotating

Protection of the turf and soil, even wear over the entire area and easy glide trough of foreign objects, soil and stones to the left or right of the sliding disc, as it is almost constantly in rotation.

Large contact surface

The large contact surface has a damping effect and thus reduces system oscillations and vibrations. Holes in the ground do not cause the pickup to sag and thus ensure an ideal working result.

Simple wear part

The base plate carries the wear plate. The wear plate, made of hardened boron steel, is simple and cost-effective. This ensures that wear costs remain low even in difficult, hard ground conditions



Via the truss, the forces are transmitted into the back



Leave Stones Trailing tines

Next to the flexible pick-up, the trailing tines are the most important component for the cleanest forage. The tines are arranged dragging on the rake line, which means they react passively when they come into contact with the ground. Forage is picked up cleanly, dirt, soil, stones and foreign objects remain on the ground.

No aggressive ground contact possible

Due to the trailing geometry, aggressive contact with the ground contact is not possible at all. For short bumps, etc., additional ground ground adaptation can be achieved. This protects the whole system.

Tine legs do not bend when cornering

RESPIRO Pick-Up technology has virtually no bent tines. The dragging geometry is the reason for this. A thankful advantage in practice. Tedious tine alignment is a thing of the past.

Stones and foreign bodies remain in place

Contact with stones and foreign bodies is repellent. As a result, they remain on the field. There are no stone splinters in the forage. The following harvester is protected.

Plant stems are not uprooted

This is particularly important with maize straw. Stalks cannot be uprooted, so neither stones nor soil get into the straw. Ideal for minimising wear on subsequent cutterbars.



Less wear and breakage

Due to the low load on the tine legs there is significantly less wear. The tines are protected and have a very long service life.



Simple & safe Anti-Loss System

The dream of every technician : to have to screw as little as possible to the pick-up. The Anti-Loss System fulfils this dream and makes it possible.



Unique tine mounting

A single M8 bolt secures 6 double tines. Changing the tines is simple and quick.

Tines broken in the winding are not lost

In the event of a broken coil, the tine remains suspended in the support. Thus, broken tines run in circles without consequential damage - replacement at the next opportunity is sufficient.

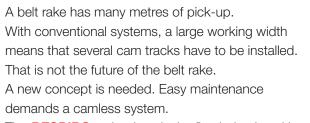
Tine winding is supported from the inside

Another feature of the ingeniously simple solution: the tine winding is solidly supported from the inside. This guarantees an extremely long service life of the tines.

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Convincing Simple The camless pick-up

maintenance-free!



The **RESPIRO** technology is the first belt rake with a camless pick-up, a real milestone.

Radically simply built

No axial movement

Simple rotation, no additional moving

robust, reliable, simple. Built for practice.

Another significant technical plus point.

The precise mounting of the pick-up tines com-

fully loaded pick-up shaft reduces lateral wear

between the pick-up tines and the scraper.

A well thought-out overall system.

bined with the axially backlash-free design of the

parts, no additional wear and tear. Compact,



Significantly fewer components

A central axle with a hexagonal profile transmits the power to the tine carrier discs. No unnecessary bearing points, control rollers, cam tracks and tine carrier profiles. Why complicate things when they can be so simple?

Allows small diameter

Little crop spread over the area - that is the highest challenge for a pick-up system.

Only the small diameter opens the door for an uncontrolled, simple pick-up.

Centre drive with 2 double bearing units on each side

The torque of the pick-up shaft is halved. The centre drive with gears is maintenance-free.

competitor

max.

RESPIRO





rotary rake

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Gentle & powerful Small diameter, or to put it another way, the low height of the pick-up is another key of the **RESPIRO** technology. The flow of the crop is ideal. The crop flows harmoniously onto the conveyor belt. Convincingly simple and efficient. The performance of the system

is amazing. Depending on the operating conditions, working speeds of up to 25 km/h are possible. Despite the high performance, the mechanical stress on the crop remains low. This ensures high protein content through very low crumble losses of valuable leaf mass.

Small distance between tine rows

The six-row pick-up with such a small diameter delivers a harmonious sequence of tines. The seamless sequence of tines lifts the crop quickly and very gently from the ground. Optimum crop flow is the result.

Powerful even with short forage

The small pick-up lifts the forage out of the stubble immediately and without interruption. This means that even short forage can be raked effectively. This increases the productivity of the **RESPIRO** belt rake enormously.

Underruns large swath

When turning swaths and with high harvest yields, the small pick-up has another decisive advantage: the harvest mass floats on the pick-up.
Harmonious, powerful and efficient. Despite very high masses, the Pick-Up requires very little drive torque. Ideal for energy efficiency and service life.

Low tine impact speed

Due to the small overall height of the Pick-Up, the tine speed can be kept very low. The crop wave nevertheless floats up, is taken over by the rotor and guided onto the conveyor belt. Especially for legumes and for crops with a high dry matter content. Less leaf loss and more protein.

Enables the trailing tine

The trailing tine was never "planned". Practice has produced it. Because the diameter of the pick-up is so small, the tines can be dragged. At the height of the mowing horizon, the tines lift the crop dynamically out of the stubble. The secret of the **RESPIRO** system.

Perfect crop flow Conveyor rotor and swath roller

A guided crop flow delivers very high flexibility in operation. Whether the crop is short or long, dry or wet, the working speed high or low, the feed rotor ensures a good flow. This delivers uniform swaths. The key to the productivity of the following harvester.



Ensures a uniform crop flow

The synchronously running elements pick-up and conveyor rotor work hand in hand. The pick-up lifts gently from the ground, the rotor conveys onto the belt. An ideal combination.

The conveyor rotor is one of the decisive factors for the high working speed.

Conveyor rotor hydraulically relieved and height adjustable.

If a lot of mass comes in or a swath is moved again, the rotor automatically moves upwards, thus increasing the swallowing capacity and the performance.

Swath roller guides the crop flow to Pick-Up

The swath roller allows even very short crops to be picked up from the ground with little loss. Even at the headland, no forage remains in front of the pick-up when it is lifted.



Rotor module: Suspension and damping from the rotor can be adjusted.

Belt with split studs

ц С

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Conveyor

Better conveying effect especially with dry material (hay, straw, lucerne) More even conveying, no pile formation

Multi-layer PVC belt with edge reinforcement

► Longer service life

▶ Better lateral stability



Belt drive is via hydraulic motor OMR with leakage oil line - a coupling for tension-free drive sits in between.

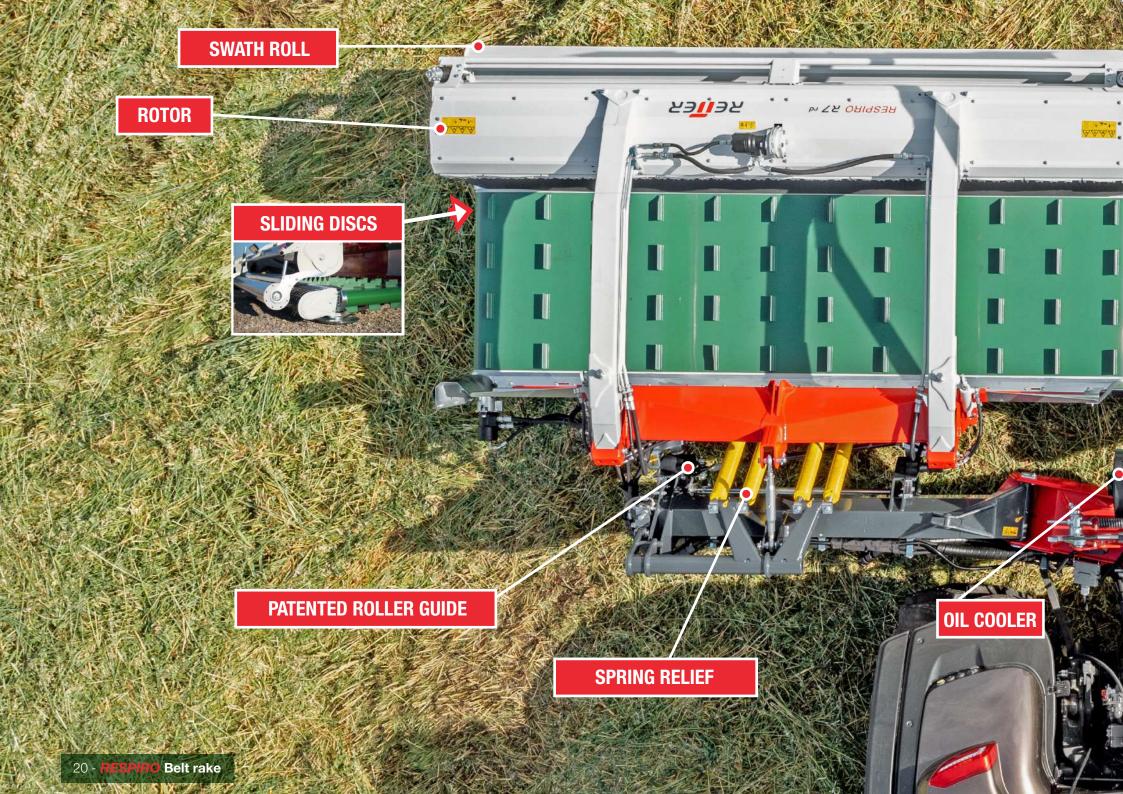


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The belt valve determines the depositing direction and the belt speed - both adjustable via the terminal.



Belt roller bearing via robust standard flange bearings - adjustable scrapers clean the rollers.





SPECIAL CONVEYOR BELT

FLEXIBLE PICK-UP

TECHNIC. PERFORMANCE. PROTECTION. RESPIRO R6 & R7rd

TRANSPORT LOCK

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PJ ZZ OBIdSEB

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RESPIRO R6 rd | R7 rd Never drive over the forage again

Compared to conventional windrowing technology, the *RESPIRO* R6 rd / R7 rd is never driven over the forage.

As with front-mounted rakes, the **RESPIRO** R6 rd / R7 rd rakes in front of the tractor, but in reverse gear. The pick-up of the machine can be set higher as nothing has to be "tickled" out of the tracks. Less ground contact, fewer stones and dirt in the forage.

A unique feature is the perfect view of the working units. The driver has a full view of the machine and can therefore relax during a long working day. Swaths can be placed perfectly side by side, as the driver has a direct view of the machine.

Manoeuvrable like a self-propelled machine - we turn on the rear axle. Little space required at the headland, tight turning manoeuvres possible. The machine is lifted out via the tractor linkage - quick and easy. Large lifting height, easy driving over ready-laid swaths.

Perfect swathing of field corners - swath out to the last corner with the belt stopped and then carry the forage on the belt into the field.



Top productivity of your harvesting technology Perfect swaths from the first to the last cut



Side swath

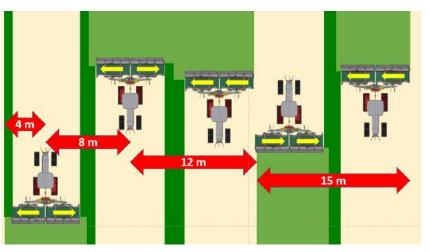
- ▶ Single side swath 7 m left or right
- Double side swath 15 m in one swath more mass than a 4-rotor rake can manage.
- Multiple lifting with less up to over 50 m no increase in forage increase in forage contamination.
- ➤ Sufficient swath mass for harvesting equipment can be achieved.



Ploughing apart

- 8 m swath 2 small swaths are placed next to each other
- ▶ For extremely high swath masses.

Fahrstrategien



With a wide variety of driving strategies, sufficient mass is efficiently achieved for the harvesting chain - fewer passes of the harvesting chain - higher efficiency - lower diesel consumption - less soil compaction.

Due to the small pick-up diameter and the feed rotor, repeated overlifting is no problem. The swaths are laid down loosely. Better post-drying, higher driving speed of the harvester.

In comparison, the roundabout rake compacts the crop and leads to poorer post-drying.

Quickly from one field to another

Compact & safe



The robust folding frame is mounted very short, so the centre of gravity is close to the tractor. The hitching is carried out via double-cut lugs cat. A centring aid facilitates coupling.

The working units are folded via two double-acting cylinders, which also ensures safe folding on slopes. The mechanical transport lock secures the machine during road transport. This can be released hydraulically, no cable pull necessary.

The **RESPIRO R6 rd / R7 rd** can be parked both wide in working position and compact in transport position. Only a minimum of space is required. Secure standing via folding support feet on both sides.

With an outer width of only 2.4 m, you can move safely and quickly from one field to another. The narrow machine ensures a perfect view to the rear via the rear-view mirrors. The working units are securely locked for road transport via the hydraulic spring tensioner, so there is no rocking.



Safe on the road



Mechanical transport lock of the outriggers



Transport securing of the working units via hydraulic spring clamp

Fast reaction - constant raking height

Centre of gravity close to the tractor

A new feature is the patented suspension of the working units via two support rollers and an upper link. This enables a very compact design and thus a centre of gravity that is close to the tractor. This is very important in practice.

In the main working area of the support roller, the cam track is arranged at an angle. This patented solution results in particularly good and responsive ground hugging.

Each working unit is relieved via four springs. The high spring length enables very good relief over a large working distance.

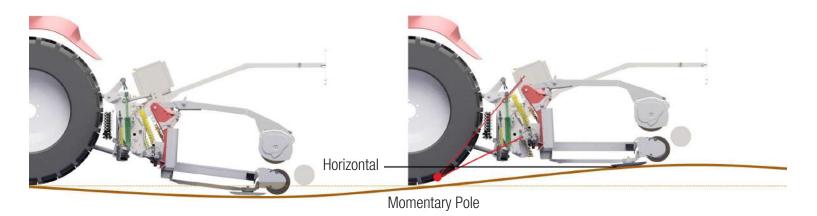
The contact pressure can be adjusted on the move via the hydraulic spring tensioner. An easy-to-read scale helps with the adjustment.

- Approx. 200-300 kg support weight per working unit
- ► Low wear on the sliding plates
- ► No grinding marks
- ▶ The sward is not damaged
- An important contribution to clean forage

In addition, the working unit follows the ground contour better in the longitudinal direction and thus ensures a constant raking height. This increases the service life of the machine and reduces wear despite the very compact design.

- ▶ Less potential ground contact
- ► Less forage contamination
- ▸ Less raking losses

A transverse adjustment of +/- 10 degrees is possible.



Simple operating concept Simple & Practical

The pick-up, rotor and belt are driven via 2 single-acting hydraulic connections. The pick-up and rotor speed is adjusted via the oil flow rate. The required oil flow rate is achieved even at low engine speed, so that the tractor runs in the optimum speed range, efficiently and fuel-saving.

The rear hydraulics of the tractor are used for lifting at the headland.

The folding, adjustment of the spring relief and the rotor height are operated via the terminal. A load sensing connection or a single-acting connection with return flow is required for this.

Terminal functions

- ▶ Folding in transport or working position
- Adjustment of support pressure via hydraulic spring tensioner or locking of the working units
- ▶ Rotor preselection (lock, lift, floating position for work)
- ▶ Rotor lift (hay, straw,...)
- Deposit direction (side deposit left or right / ploughing apart) with belt stop
- Adjustment of belt speed via potentiometer
- Adjustment of raking height via hydraulic top link from tractor

Oil cooler

An oil cooler is integrated in the return from the oil circuit.

- No unnecessary overheating occurs system temperature remains low
- ▶ Long service life of the hydraulic components
- ▶ Integrated reversing circuit on the oil cooler for automatic cleaning







RESPIRO AT UPWIND.





Datasheet RESPIRO R6rd | R7rd

| | RESPIRO R6 rd | RESPIRO R7 rd |
|--|-------------------|----------------------|
| Working width side swath [m] | 6,00 + swath | 7,00 + swath |
| Belt with [mm] | 700 / 1000 | 1000 |
| Transport length [m] | 2,37 / 2,67 | 2,67 |
| Transport width [m] | 2,40 | 2,40 |
| Transport height [m] | 3,50 | 4,00 |
| Parking height [m] | 3,10 | 3,60 |
| Weight [kg] | 2950 / 3150 | 3380 |
| Area output [ha/h] | 4-8 | 5-10 |
| Required hydraulic connections | 2 EW + LS | 2 EW + LS |
| Required electrical connections [ha/h] | 1x3 pin / 1x7 pin | |

Options

The right accessories for your needs

- ▶ Sliding Discs Robalon
- ▶ Swath cloth

Requirement for the tractor Necessary connections

- ▶ 2x DA for drive of left and right pick-up, belt and rotor
- ▶ Load sensing for convenient operation (pressure circulation also possible)
- ▶ Reverse drive system
- Min. 160 hp on level ground, 6 cylinder tractor
- ▶ Oil pump min. 160 l/min
- ▶ 800 1200 kg front ballast
- A hydraulic top link is recommended for rake height adjustment

COWS WOULD BUY RESPIRO.



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RESPIRO - Plants, animals, machines and humans respire...