



NEW!
THE DOUBLE-WHEEL
RAKE



SPEED



CLEANLINESS



SAVINGS



RA-Rake project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 778475

"This machine is from hell!" RA-Rake and its stellar performance, even under extreme conditions

Interview with Fabrizio Girometta, one of the first farmers who tried the new machinery on partially crushed corn stems.

"A mix between a rake and a broom in the field: I have never seen a machine work like this!", says Fabrizio Girometta, of Girometta Pietro Villa Anna farm of Cortemaggiore (PC), Italy. Fabrizio raises cattle and produces cereal crops for forage.

*"I have used RA-Rake in difficult conditions: the product is heterogeneous, as the residue is mixed with partially crushed corn plants. The rake or, better to say, your "broom-rake" combines these two operations in the field: **the double wheel moves the product and at the same time cleans the field**, just like a rake and a broom, in any working condition, even in the presence of a soil with deep carriageways that were formed in the springtime, but the machine, incredibly, can collect both the "long and the short",*

the farmer enthusiastically comments. Even under these extreme working conditions, **the early opinion of those who have tried the machine, still a not-for-sale prototype, is very positive.**

"This rake has an enviable feature that makes it difficult to compare to any other rake... you get both the cleanest crop AND a very satisfactory hourly productivity (on average, 7 hectares per hour in regular soil and without drains)"

says the farmer,

"if you use any other rake, under these conditions, you will not reach this hourly productivity and, at the same time, you'll end up with a much dirtier crop."

But how do you achieve these results? By using new technology, IT, expensive tools? None of this: **RA-Rake uses an established solution in a new way, with no need for major investments.**

"The double wheel rake is a simple machine (I would almost call it primitive), but in its simplicity it is revolutionary, because it combines speed of work with a very high quality of the crop,"

concludes Girometta.

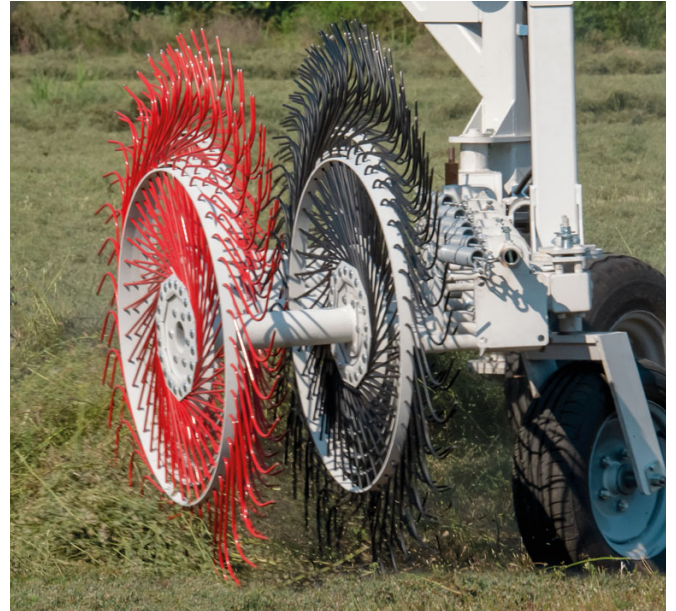
"And if these are the results obtained on a difficult crop, such as the residues of threshing corn, for sure with forage or alfalfa, they will be even better... kudos to innovative designers!"





The technology

The RA-Rake double-wheel rakes feature several coaxial pairs of wheels (the rear driving wheel never comes into contact with the forage which is moved by the front wheel, raised above the ground. Thus, a higher quality of forage is guaranteed, both in terms of lower ash pollution and of nutritional value).



Higher protein and fiber, lower ash content = Better forage quality

Interview with Andrea Gerosa, who holds a degree in Agricultural and Environmental Sciences with a dissertation on "An estimate of fibre digestibility in dairy cattle" and is a Project collaborator at the University of Milan..

Let's start with your dissertation: how important is fiber in cattle nutrition?

"A lot! A high amount of ingested fiber means that the food stays in the rumen longer; this has an impact on animal welfare and also on the quantity and quality of milk production. Hay is rich in fibre, but forage must also be palatable, and this depends very much on the amount of protein it contains."

So more protein, higher quality forage. But during the raking of alfalfa, a valuable forage, a part of the leaf containing the raw protein is destroyed.

What can be done then to preserve protein during raking?

"The harvesting technique has an impact on forage, so surely one of the factors affecting the quality of forage is what type of rake is being used."

Preliminary tests carried out by the University of Milan¹ reveal an interesting trend: **with RA-Rake we have a lower protein loss (-6%)** compared to -13% for the rotary rake; therefore, the forage swept with RA-Rake preserves (proportionally) twice as much protein as the traditional rotary rake.

How important is it to avoid contamination with stones and soil, that is, the so-called exogenous ashes²?

*"Very important: **ashes are the main culprits for the presence of clostridia in forage.** Therefore, during haymaking, it is important to minimize the risk of contamination and to adopt every possible technique for producing forage of excellent quality, both from a nutritional and a health point of view."*

Preliminary tests reveal that the forage harvested with the RA-Rake loses 7.5% of its ashes, while the rotary rake loses a smaller amount (-5.7%); therefore, **less total ash = cleaner and healthier forage.**



RA-Rake vs rotary rake

- **CLEANER** forage
- **FASTER**
- **FEWER** operating and servicing costs

RA-Rake vs merger rake

- **MUCH LOWER** investment
- **FASTER**
- **FEWER** operating and servicing costs

RA-Rake vs sidebar rake

- **FASTER**
- **MORE** working width
- **SIMPLER** technology

¹ Currently still being validated.

² Exogenous ashes = ashes coming from the environment outside the forage (stones and

soil). Endogenous ashes, on the other hand, are those naturally present in the leaf and the stem of the plant and therefore have a positive impact on animal health.

RA-Rake. The benefits

For farmers

- High quality of forage: more protein, less exogenous (= derived from soil and stones) ashes
- Increased livestock productivity³
- Better milk quality
- Greater digestibility and animal welfare

For forage producers

- Higher revenues for quality of forage
- Customer loyalty: excellent forage, satisfied customers
- Working speed
- Savings in operating and maintenance costs

For farm equipment operators

- Working speed
- Adaptable to all types of forage
- Reduced downtime for maintenance
- Customer loyalty thanks to the quality of forage

3) "Evaluation of the importance of digestibility of neutral detergent fibre from forage: effects on dry matter intake and milk yield of dairy cows" - Oba and Allen - 1999.

Technical data sheet

Models	Working width	Transport width	Transport height	Front wheels	Back wheels	Transport steering wheels	Secondary swivel wheels	Weight	Minimum tractor horsepower
12+12 VS	7,5 m 24.60 ft.	3 m 9.84 ft.	2 m 6.56 ft.	12	12	10.0/75-R15.3	205/70-R15	2,480 kg 5,470 lb	40 HP
14+14 VS	9 m 29.53 ft.	3 m 9.84 ft.	2 m 6.56 ft.	14	14	10.0/75-R15.3	205/70-R15	2,650 kg 5,850 lb	40 HP

Company profile

Founded in 1898, Repossi Macchine Agricole is now in its third century of activity.

At the end of World War II, the company focused on the design and production of haymaking machines, under the guidance of Felice Repossi.

During these years, the first trailed sidebar rakes (called FORTUNA) were designed and later joined by other types of rakes (self-propelled, rotary, double, triple and electro-hydraulic), hay tedders, machines for stables, etc. Today the company markets a wide range of products and services, as a result of its high specialization and competence.

The company is still owned by the Repossi family and is now in its fourth generation.

Over the years, Repossi has filed more than 30 patents (two international patents in 2010 alone) and has received numerous awards, the latest being the International Enterprise Award 2009 awarded on June 14, 2010 by the Chamber of Commerce of Pavia.

Thanks to its history and the results, in 2007 Repossi received the prestigious "Loyalty to Work and Economic Progress Award" from the Chamber of Commerce of Pavia.

In 2017 Repossi obtained an important Horizon 2020 funding from the European Commission for the innovative patented double-wheel rake RA-Rake.

Today the company designs and manufactures haymaking and breeding machines.

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