

LELY VOYAGER

Automatic grazing system



Frontal grazing: the innovative way

- *Reduces forage waste*
- *Increases cows' harvesting efficiency*
- *Avoids variations in milk production and milk composition*
- *Labour saving*

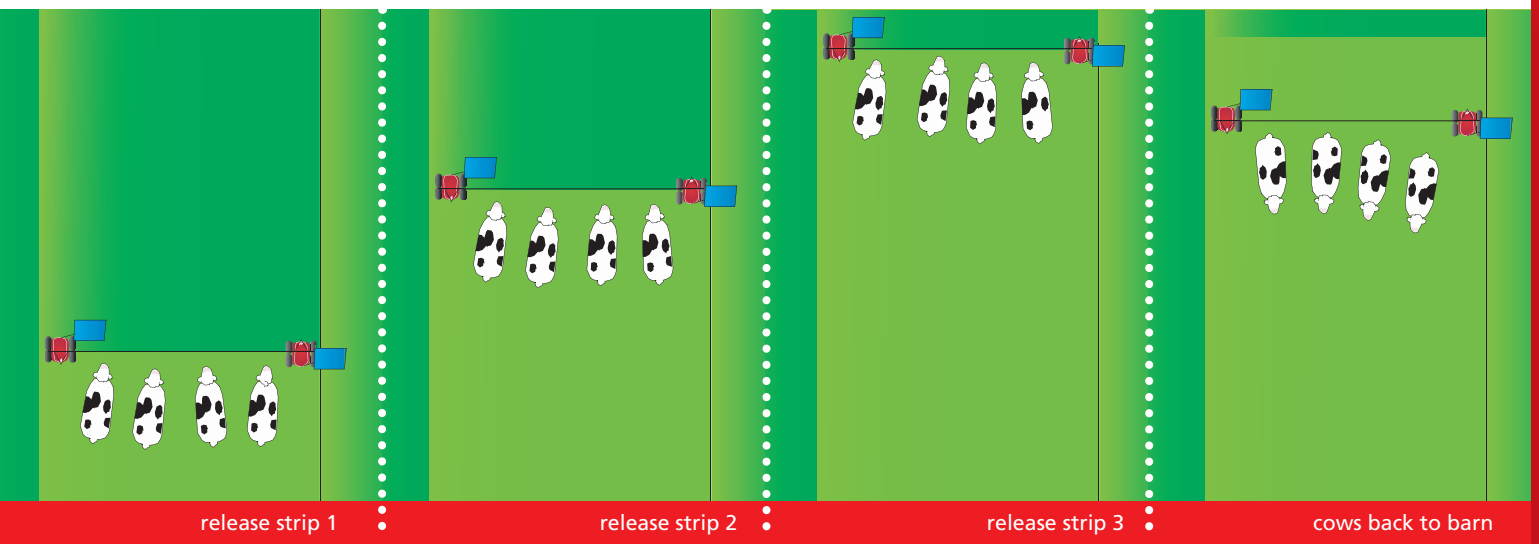


— innovators in agriculture —



Voyager: automatic grazing system

Pasture and grazing management is a science that dairy farmers have applied for ages. Pasture grazing can provide inexpensive nutrients to aid growth and production. Frontal grazing is the most efficient type of grazing system. But it is also the most labour-intensive system. For this reason, Lely, in close co-operation with its customers has developed the revolutionary Voyager automatic grazing system. With this system, you don't need to move up the fencing yourself: the Voyager will release several narrow strips of fresh forage over the day. The Voyager automatic grazing system is suitable for farms with or without an automatic milking system. In both cases, farmers will appreciate the benefits of this revolutionary grazing concept.



Lely is taking frontal grazing one step further with the Voyager automatic grazing system.

- 1) The Voyager system allows livestock to continuously graze on fresh forage, all through the day. Since fresh feed is provided continuously and there is less competition for fresh forage, the herd remains calm and milk production remains stable. This makes the system suitable for pastures with large areas and even for pastures that can be fully grazed in one day.
- 2) The Voyager system has the advantage of having a minimal amount of forage lost due to trampling and fouling with manure and urine. Each time, a new piece of pasture is released, which has not previously been trampled underfoot. The Voyager system helps farmers to efficiently produce high-quality forage.
- 3) More efficient land use; when there is an excess of roughage, the dairy farmer can opt to crop the excess grassland for use by third parties. This also gives dairy farmers the possibility to use land for more profitable alternatives.
- 4) Labour saving; frontal grazing is generally acknowledged to be the optimal form of grazing. Labour is often the limiting factor in this concept. With the Voyager grazing system, this problem is forestalled.
- 5) Flexibility; with the introduction of the Voyager, Lely provides a solution to bring the cows remaining in the pasture back into the barn at set times. It goes without saying that this also provides a solution for situations when robotic milking systems do the milking or in conventional situations, since the same challenges apply.

The Voyager automatic grazing system in detail



ROBOT 1



How the Voyager Works

The intelligent Voyager grazing system consists of 2 mobile robots. A solar panel provides power for the battery and gives each robot total autonomy. The robots allocate the forage by means of a pre-programmed time and number of metres. The only thing the farmer has to do is set per field how many metres per day he wishes to give the cows and the Voyager will make the calculations and release this distance during the day.

An electrified wire is moved forward and releases the pasture during the day, but can also be used to drive the cows back inside several times a day for milking, for example. The wire remains tight thanks to the reel in one of the robots. The robots communicate with each other via Bluetooth and follow the form of the pasture by means of a wire follower. The pasture is thus fenced off from the grazing cattle.



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ROBOT 2

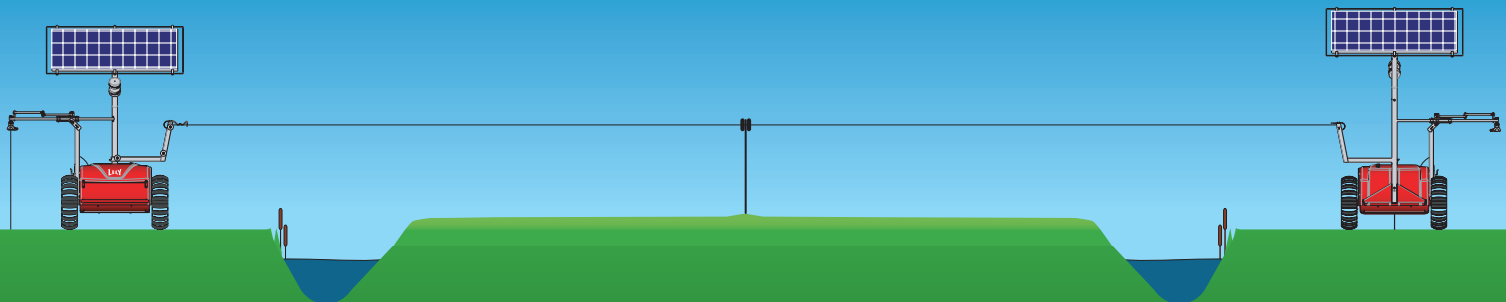


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- 1 Both robots are synchronised via Bluetooth.
 - 2 Peak energy source; 80 Wp (equal to 80 Watts). The angle is optimally set for spring and autumn. It can also be rotated (to the south). Solar panel 110 Ah; charges the battery, which is used to bridge periods with little sunshine.
 - 3 Keeps the wire tight and ensures that the length is variable (can release and reel in wire).
 - 4 Four wheel steering/four wheel drive (left and right can be individually controlled, but all the wheels are driven). Traction of the robots ensures a good grip, and is open to prevent fouling. The special form of the wheel ensures directional grip, while it is rounded cross-ways to minimise damage to the turf when steering.
 - 5 Wire follower; follows the leader wire along the field. The system with the follower keeps the robot parallel to the wire at a fixed distance (approx. 50 cm). Turns of up to approx. 45 degrees are possible.
 - 6 The shock device provides a gentle shock to the wire and the bracket at the extremities of the robots to keep cattle and united guests at a distance.
 - 7 Operation via E-link remote control with user interface, incl. feedback.
- The Voyager automatic grazing system consists of two mobile, solar-powered robots.
 - Synchronisation between the two robots ensures that they follow the same programme, or that the second robot can be remotely controlled.
 - Leak-proof battery; 12V 110 Ah.
 - Minor soil unevenness is no problem.
 - Printed circuit board specially developed for Lely with control software designed by Lely.

TECHNICAL DATA

Length	123 cm
Width (incl. panel)	131 cm
Height	215 cm
Weight of robot 1 (including reel and electrified wire)	173 kg
Weight of robot 2 (including shock device)	167 kg



Larger distances up to hundreds of metres can be bridged by means of support wheels and/or assist wheels. Ditches in between fields do not pose an obstacle for the system.



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What the grazing experts have taught us

Grazing animals are very selective in their grazing behaviour. They generally consume the best quality forage first and leave the rest until last. Unfortunately, that which is left is subjected to increased amounts of trampling and fouling with manure and urine. As a result, the bigger the pasture in which the animals are allowed to graze, the greater the amount of forage wasted and the lower the quality of feed on offer. Moreover, animal performance can also be negatively influenced.

For this reason the Voyager grazing system releases narrow strips only when the previous strip has been consumed. When it comes to meeting the nutritional requirements of animals on pasture, it is important to recognise that a high-yielding dairy cow at peak milk production has both an enormous appetite and a need for an extremely high-quality feed. In order to maintain high and consistent levels of milk production and healthy rumen activity, lactating dairy cows should have continuous access to controlled, issued rations. The Voyager controls the grass intake and ensures constant milk production. Frontal grazing by

means of the Voyager is a method of intensive grazing management that allows livestock to continuously graze on fresh forage. Because the cows have a small strip of fresh pasture each time, the grass is well cropped, which not only makes the rumen function better, but also achieves a better proportional intake of protein and sugars. This system utilises high stocking densities but has the potential advantage of having a minimal amount of forage loss. Various studies around the world have demonstrated increased efficiency when the Voyager system is applied, resulting in lower feeding costs and/or increased milk yield.

Live Life Lely

Since its establishment, Lely has always been committed to improving the quality of life of agricultural entrepreneurs as well as the future of the sector. In addition, the company is innovative in its products as well as its concepts for marketing and distribution.

- Lely is committed to helping farmers ahead of market developments
- Lely always supplies the most innovative products to farmers and contractors
- Lely provides customers with optimum customer service
- Everything Lely invents will always serve to make life easier for the benefit of both man and animal as well as providing joy to all our employees

In short: we at Lely do our work in order to serve farmers and to make their lives as enjoyable as possible. From grassland machinery to the automatic milking system, Lely thinks with the farmer and has offered him innovative solutions for the past 60 years. With the introduction of the Voyager automatic grazing system, Lely is the first company to bring automation to grazing management!

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