Already 50 years

Productivity in harmony with nature
Crimping - for successful farming

Why is crimping profitable?
- No drying costs
- Lower labour costs
- Appetising feed
- Less weather-reliant
- Longer threshing period
- Up to 20% larger grain harvest (dry matter)
- Improved feed/straw value
- You can adopt higher yield varieties
- You can thresh three weeks earlier, at a time of highest nutrient content
- Reduces toxin levels
- Milk even 11% more

By crimping into a plastic tube...
- No need for silos or dryers
- It takes just one operation to crimp and preserve the grain
- Quick and easy
- Your grain preservation system gives optimum productivity

Financial gain from crimping!

Preservation costs: EUR/ton (25% moisture content)

<table>
<thead>
<tr>
<th>Moisture Content</th>
<th>Drying</th>
<th>Crimping and storing in planisilo</th>
<th>Crimping and storing in tube bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 000</td>
<td></td>
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<tr>
<td>500 000</td>
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<tr>
<td>1 000 000</td>
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</tbody>
</table>

Saving compared to drying / EUR
(Ask to your dealer to make your personal calculation)

Source: TTS 2017/12 - Reetta Palva

Scan me
High quality cost-effective feed

Crimping is a cost-effective way to produce high-quality feed for all livestock. It improves profitability of the farm by reducing costs of investments (dryer, storage) and energy (oil, electricity). Production costs of crimped grain are much lower than those of dried grain.

Crimped grain is ready to feed without any further processing. It can be used directly from the storage for feeding as such or as a component of Total Mixed Rations (TMR) for cattle or in liquid feed for pigs. Ensiling of crimped grain is based on lactic acid fermentation by lactic acid bacteria. Favourable environment for lactic acid fermentation is created by lowering the pH of crimped grain to the level of 4 and by anaerobic conditions.

Cultivation technique and harvesting

Grain for crimping can be cultivated similarly to grain for drying, but it is harvested 2-3 weeks earlier at the yellowish stage when the grain’s energy content and protein content are at their highest. Early harvesting allows cultivation of late varieties with higher yield potential. Fertilization is also more flexible and manure can be used more freely. Grain at the yellowish stage is softer and bigger than at the mature stage. The moisture content of the grain is typically 30-40%.

Crimping in a nutshell

- Harvest 2 to 3 weeks earlier than normally at yellowish stage;
- Optimal grain moisture 30-45%.
- Crimp on the field or at the storage with Murska crimper.
- Use additive 3-5 liters per ton.
- Store in bunker silos, plastic tubes, bags or tower silos.
- Remember careful compacting, covering and weighing.
- Feeding can start about 3 weeks after closing the silo.

Storage

Crimped grain can be stored in plastic tubes, bunker/horizontal silos, clamps or airtight tower silos.

Bagging of crimped grain

Bagging of crimped grain in plastic tubes is low-cost and simple grain processing and storage method. Bagging is easy, since no consolidation or weighing is needed. No fixed storages are needed and size of the tube can be adjusted according to the yield. Crimping in bags is flexible as it can be stopped at any time and continued later. Bagging is also less weather dependent than ensiling in clamp silos.

High-value low-cost feed with crimping

- Crimped grain has high nutritive value.
- Crimped grain fits perfectly in total mixed rations.
- Crimped grain can be used for all livestock.
- Cost per energy unit of crimped grain is lower than that of dried grain.
- Phosphorus utilization in pigs and poultry fed with crimped grain is better than in those fed with dried grain.
- Crimped grain fits well in liquid feeding systems.
- Crimped grain is dust-free.
- Crimping is a low-energy method of processing feed grain.
- Crimping allows the use of later cereal and maize varieties; harvesting even under unfavourable weather conditions.
- Reduces toxin levels.

Crimping and ensiling

A specialized Murska crimping machine is used to process the grain. Add the crimping additive into the crimping machine to achieve good mixing of additive in the grain. Crimped grain with high moisture content is easy to consolidate to exclude air. If the grain is crimped in the field, it is unloaded directly from the combine into the crimper, crimped, and at the same time the additive is added. Finally, crimped grain is lifted with elevator to the trailer and transported to the storage site.

Valuable and low-cost feed for all livestock

Despite of the earlier harvesting time, the nutrient content of crimped grain is similar to that of the grain harvested at full mature stage. Crimped corn is very high performance feed and can achieve even 11% increase for the milk production of dairy cows.

Ruminants

Beef cattle grow as well or even faster with crimped grain as compared to dried grain. Several studies have confirmed that dairy cows produce as much milk with crimped grain as with dried grain.

Overall nutritive value of crimped grain for ruminants is similar to that of dried grain. The actual amounts of crimped grain fed or used in TMR are higher than those of dried grain due to lower dry matter content of crimped grain. Otherwise crimped grain can be fed as dry grain and it can completely replace dry grain in feeding.

Pigs

Crimped grain can be fed to pigs as such. It fits perfectly for liquid feeding. In practice, 8-10% variation in dry matter content of grain does not affect the daily growth or the feed conversion ratio. Vitamin E content is lower in crimped grain. In practice, crimped grain can fully replace dried grain in the feeding of pigs.

Poultry

Crimped grain as such is palatable feed for poultry, too. Crimped grain improves both daily weight gain and feed conversion ratio of broiler chickens. This is related to the 25% higher energy value of crimped grain as compared to that of dried grain. Energy value is increased due to the lower β-glucan content in crimped grain resulting in lower gut content viscosity. This effect is similar to that of β-glucanase enzyme. Digestibility of lysine and threonine are increased in broilers fed crimped grain as compared to those fed dried grain. Similarly to pigs, digestibility of phosphorus is increased, too.
W-Crimping technology

Murska W-Max is a power mill, designed to meet the user’s every need. W-Max will achieve up to 50 tonnes/hour (maize) performance at low energy need. The new grinding crimping technology gives perfect results. The W-roller can be used on all feed grains, whether dry or harvest-moist: oats, barley, wheat, maize, peas, beans and mixed grains.

Murska W-Max is comfortably quiet and really fun to use. It is capable of carrying a large volume of preservative. It is easy to adjust the crimping level, but this is seldom necessary. The service points are easily accessible. The advanced control system allows the user to stop thinking about the preservative dosage and the crimped tons of grain. Is there any easier way to preserve grain?

W-Data control system

The optional control system facilitates use. The mill has automatic fill control, and preservative dosing is based on the moisture content of the grain. When the work is complete, the system sends a report to a mobile phone, and the contractor can attach it to his invoice. The report details the time spent, the amount of preservative added and the total volume of the crimped cereal. The system will also produce interim data. The control system takes care of user and machine security. In the event of a disruption, the mill alerts the user and stops the supply of grain.

Surprising performance W-Max 15

A capacity is up to 30 tonnes/hr of harvest-moist grain. A tube packing machine or 3-5 m discharge elevator can be placed on the multipurpose chassis.

Favorite model W-Max 10

A capacity is up to 20 tonnes/hr of harvest-moist grain. A tube packing machine or 3-5 m discharge elevator can be placed on the multipurpose chassis.

Best of the bests W-Max 20C

Murska W-Max 20C is a high-performance professional product, designed to the last detail. Drawn by a tractor, the mill runs smoothly and comfortably along the bumpiest of roads, thanks to a spring bogie. It accommodates up to 2800 litres of additive. There is a wide range of transporter options.

W-Scrapers

Enables crimping high moist pea and horse bean grain mixtures. Available as optional for all W-Max models.
The roller mill for successful farming!

Murska roller mills have become known for their power and their durable rollers. Murska machines are easy to use and maintain. Operating reliability has been confirmed globally in all conditions and circumstances. Murska’s experience in crimping goes back to 1969.

**Murska 2000 S 2x2**

The technical specifications of the Murska 2000 S 2x2 are the same as for its smaller version, the 1400 S 2x2, but with enhanced crimping capacity of up to 50 t/h. This is usually enough for even the busiest farmer or contractor. A wise choice, if time is of the essence.

**Murska 350 S2**

The mill has three-point linkage and it is generally powered by a tractor. Power requirement is 30-40 hp, and 15 kW with an electric motor. Wet grain crimping capacity is 5 t/h, while with dry grain it is 3-10 t/h, depending on the roller surface.

**Murska 700 HD**

The smallest HD model is the Murska 700 HD, which is excellent on medium-sized and slightly larger farms. The mill incorporates gear-driven specially hardened rollers, which will crimp millions of kilos of feed grain. Wet grain capacity is 10 t/h, while with dry grain it is 8-20 t/h, depending on roller surface. Tractor power requirement is 70-80 hp.

**Murska 1000 HD**

A larger model in the HD range, the 1000 HD looks the same as the 700 HD and has the same technical specifications, but it is equipped with longer rollers. Crimping capacity is up to 30 t/h. The efficient operation of the Murska 1000 HD requires an 80-90 hp tractor.

**Murska 1400 S 2x2**

The Murska 1400 S 2x2 is equipped with a unique roller cassette, driven by four gears, achieving a crimping capacity of up to 40 t/h. The tractor power requirement is 140 hp. The mill has a standard transport chassis or Max bogie trailer. The latter is able to bring up to 2800 litres of additive and runs smoothly drawn by a tractor. Standard equipment includes hydraulic elevator tilt, working lights and a tool box. The Murska 1400 S 2x2 is an ideal machine for crimping large quantities of feed grain in a short space of time.

**Diverse range of equipment**

- Trailer chassis for Murska 350-1000 roller mills
- Bagger tube packing machine
- Acid bottle stand for a 200 litre barrel with hoist
- Additional hopper
- Range of rollers: 2, 3 and 4 mm groove pattern and spot flute
- Three times more operating time with super rollers

Please see the technical specifications on page 10
The Murska roller mill equipped with a bagger crimps, adds preservative and packs the harvest-moist grain into an airtight plastic tube - all in a single operation. The crimped grain is ready-to-feed fodder, suitable for all livestock. The tube can be filled to mostly a length of 60 m, meaning that a sack measuring ø2.0 m will accommodate around 180 m³ of high-quality compacted grain.

There are available different bag sizes. The opening in the sack is easy to manage, and suitable also for minor consumption. Tube packaging comes into its own especially on farms which buy in some of its grain feed. Often, grain is delivered irregularly, and there can be a break of several days in the crimping operation. In the case of tubing, preservation can be interrupted without any additional work phases.

Equip your roller mill with a tube packing machine

Preserving grain in a plastic tube is a cost-effective and easy solution

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Murska equipments

Murska Rear elevator - elevator transport chassis as optional extra for the bagger

For situations where an elevator is necessary in addition to the bagger, for instance when the grain is crimped in the field directly from the harvester to the cart.

Assembly is easy, using for example the front loader’s lifting forks. Attachment is by quick-hitch latches.

The elevator is driven by a hydraulic motor and has a hydraulic cylinder tilt.

The rear elevator fits all bagger models.
Murska Multipurpose Chassis

Gives you a possibility to use your Murska equipment throughout the year. Crimping unit for high moisture and dry grain/maize crimping.

Dumping hopper for other times: bagging whole cereals, pressed pulp, silo maize, brewery grain, chopped whole grain etc.

Elevator
Discharge elevator conveyor tilts manually or hydraulically. Unloading height is 3.6-5.2 m.

Crimped grain flow can be adjusted in the desired direction by a remote control. (optional accessory)

Folding screw conveyor
This folding screw conveyor designed for unloading is both powerful and comfortable to use. Unloading height is 4.1 m.

Belt conveyor
The belt conveyor enables the unloading of crimped grain from both sides directly to the back because the conveyor turns 180°. This is why the mill is suitable in different kinds of crimping conditions. Unloading height is 4.1 m.

Automatic lubrication system
Automatic lubrication system is available for all Murska crimper. The system lubricates the connected items fully automatically. The user needs only to take care of filling of the lubricant container. The system pumps the optimum amount of lubricant to each lubrication point as required.

Additive pump
HP20 is reliable and easy to use. Capacity of the pump is 0-5 l/min.

Additive dispenser
Vitamins, urea/maxammon additives etc. can be dosed with crimped grains by the dispenser. It is equipped with load sensors and a tachometer to get the most accurate result.

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Pro-Device additive pump
First class accuracy and usability. Doser’s enclosure is made of stainless steel. Intelligent control electronic regulates flow to a certain constant level. A change in supply voltage, suction/pumping height or fluid level in the tank does not affect the total delivery.

Murska filling augers
The filling device transfers the grain to the roller mill, the trailer, the lorry or the silo, removing the need for another work phase, i.e. using a loader. The grain remains cleaner and there is less wear and tear on the mill rollers.

Electric motor drive
An electric motor driven crimper saves energy and helps to reduce air pollution. Automatic start-up and close down. Rotation safety guard stops the mill in case the drive-belt slips or breaks.

Murska bagger with dumping hopper, see details above.
(multipurpose chassis)

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Crimp filling device

The Murska crimp feeder can be used in conjunction with a feed cart on rails, a fixed feed mixer or a liquid feed distributor, etc. Because the crimp feeder is equipped for electricity, it is easy to place in use. The hopper’s front and back panels can be opened.

- The automatic Crimp Filler provides intermediate storage for crimped grain and dry grain, for instance, as well as acting as a filling device for feeders.
- A robust 6 m³ hopper.
- Twin-lane grain transfer from hopper to conveyor screw.
- A reliable elevator conveyor from hopper to feeder.

Pre-Crimper

Murska Pre-Crusher is designed to pre-crush horse beans, peas, corn, etc. large pulses before Murska 220SM crimper do the final secondary crimping. Electric motor drive with integrated reduction gear transfer power to the hardened gear wheel driven fluted rollers. Pre-Crimper is comfortably quiet and almost dust free. Pre-Crimper is controlled by the control box and a level sensor.

Murska roller mills for the processing of dry and acidified feed grain

The roller mill is used to crimp dry grain, to produce groat, which is more suitable for livestock feed.

The Murska 220 SM is a top-of-the-range, modern roller mill for crimping dry and propionic-acid grain. It is the result of long-term product development and is equally at home in the feeding automation chain or as part of a hand feeding system.

The rollers are at the heart of the mill, and consequently they have been the focus of special attention. They are spring-loaded, gear-driven (with both rollers driving) and hardened. Shield magnets protect the rollers from the metal.

The roller surface is optionally either spot fluted or 2 mm grooved. Spot fluted rollers are suitable for use with dry and acid grain.

Because it is possible to run the Murska 220 SM with grain between the rollers driving) and hardened. Shield magnets protect the rollers from the metal.

The hopper's front and back panels can be opened.

Diverse range of equipment for transferring grain to/from the mill

<table>
<thead>
<tr>
<th>Drawing bottom feeder</th>
<th>Drawing top feeder</th>
<th>Suction filler</th>
<th>Combined filler unit</th>
</tr>
</thead>
</table>

Murska 220 SM

- Throughput: 800-1500 kg/h
- Power requirement: 4 kW
- Height: 650-1300 mm
- Width: 650 mm
- Length: 830 mm
- Weight: 159 kg
- Hopper volume: 20 l
- Shield magnets: 2 x ø80 mm
- Weight: 180 kg
- Length: 830 mm
- Height: 650-1300 mm
- Power requirement: 4 kW
- Throughput: Max. 3000 kg/h
- Shield magnets: 2 x ø80 mm
- Length: 760 mm
- Width: 650 mm
- Height: 385 mm

Pre-Crimper

- Throughput: Max. 1500 kg/h
- Power requirement: 4 kW
- Shield magnets: 2 x ø80 mm
- Length: 760 mm
- Width: 650 mm
- Height: 385 mm

Fraser Scott - DNO Scott, The Chesters, Swarland, Morpeth, Northumberland, England

Fraser Scott was aware of the high cost of drying grain as it is not often that grain in this area can be harvested dry, and the reliance on off-farm storage and processing even though the local grain store borders the farm. Mr. Scott purchased his first machine, a Murska’s Korte 1400 in time for the 2011 harvest and enabled about 2800 t in a corner of the main silage clamp. The crimping process suited the farming system and increased the milk production at the farms. The farmers are happy with crimping: they can feed the animals with quality maize processed grain.  

Raman Codony-Codony Multieveins, Hostalets d’en Bas, Girona, Catalonia, Spain

Mr. Codony says that the health and well-being of the animals is the reason why the customers choose him as their contractor. Not only does the high quality, crimped maize improve the animal health, it also increases the milking production at the farms. The farmers are happy with crimping; they can feed the animals with quality maize processed grain.

Jarmo Sisso - Kiuruvesi, Finland

“Crimping is the best and most cost effective alternative for processing grain: the harvesting can be done at once and green grains do not disturb.” This is the conclusion Jarmo Sisso has come already with the experience of only one season.

Vasili Bytshkov - FGUP “Kalozhitsy”, Volosovo, Leningrad, Russia

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Jesper & Jørgen Nielsen’s pig farm - “We have heard from some colleagues about the success with crimped maize in pig feeding. After that knowledge of good experiences, we started with a little part of the maize in the first year. Next year we bought a new Murska S 2000 with universal rollers. After that we were able to crimp it all, maize, all kinds of grain, peas and haris and beans. Now we have crimped with the Murska S 2000 for the past four seasons, and we are getting more and more satisfied every year.”

murska.fi
It was autumn 1969 in the farm of Aimo and Gunnar Korte in Ylivieska, Finland. Their dryer machine had broken. The brothers were aware that high moisture grains could be ensiled, but it should have crimped at first. There were not machines for the purpose at that time. So they decided to begin constructing the first roller mill together with a neighbor farm. This is how the company started.