

Haymaking: guidance in hay production and storage

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Abstract. A major problem faced by cattle breeders in the Brazilian Midwest is forage seasonality, where there is a large availability of forage for animal feed during rains and a low supply of this food during drought. When there is no zootechnical planning, there can be a drop in herd production and mortality, causing losses. The project is being developed to guide and assist rural producers in the southern region of Mato Grosso to adopt a haymaking technique for the production of grass and legume hay, aiming to reduce the impacts on the productive performance of farm animals during the dry season through the supply of quality roughage. The extension workers worked in all stages of the haying process, which ranged from soil preparation to forage implantation, as well as the choice of the plant (forage crops that are easy to manage, cut and good production), mowing, raking, drying, baling and storing of the product, reporting and recording all activities. The project has been carried out, with the scheduling of technical meetings, lectures, video classes and "in loco" demonstrations about the practice of forage conservation in the experimental area of ICAT/UFR, as well as in the partner properties Estância Kratsch and Sítio Nossa Senhora Aparecida. The developed actions provided experience and experience in guiding the producer. The project was supported by the Fen@r Group, which organized events with lectures and practical demonstrations in events open to the external community, held at UFR and at the Rondonópolis Exhibition Park, during the 1st week of the Rondonópolis horse. The hay produced in the animal science sector is made available to sheep and goat herds and is kept for practical classes of the course. The assisted producers comply with the actions provided for in the project, according to the schedule for hay production on their properties. The project is not limited only to the transfer of technical knowledge but also to support producers in solving problems, improving their living conditions and ensuring the sustainability of their properties.

Keywords: Work, Roughage, Sustainability.

Contextualization and goals

The drought that has occurred in southern Mato Grosso, together with the lack of strategic zootechnical planning, has resulted in a decrease in the performance of livestock and even their losses due to food restrictions. This is due to the low supply of forage in pastures and the low nutritional value of forages. Thus, it is necessary to develop work that aims to produce and store roughage food to provide in periods of scarcity.

An animal, when well supplemented, has a body condition score within normal health parameters, with good production rates, allowing the producer to obtain a good profit margin. According to POLI and CARVALHO (2001), forage planning should be carried out according to the nutritional requirements of the animals, with the supply of

forage and should be carried out in the long, medium and short term.

Hay production is a viable alternative for meeting the demand for roughage feed, as well as partially meeting the nutritional requirements of the animals, and is versatile both for forage conservation and for the cost associated with the productive performance of each animal category. In this sense, obtaining the hay produced on a property can be economically viable. To produce hay, the forage must be cut at the appropriate height and "aged" so that it can be subjected to partial dehydration for a certain time without any nutritional losses. The ideal percentage of ideal moisture for hay is between 12% and 18%, so it can be baled and stored.

For Evangelista et al. (2004), the drying time of the material in the field is dependent on the

climatic conditions of the region, especially the intensity of solar radiation, wind speed, relative humidity and temperature. The extension workers participated in the practical process in all stages of production, both inside and outside the UFR, and developed mechanisms to transmit knowledge to the external community.

Methodology

Practical application of the haymaking technique involves the use of harvesters and cleavers to cut plants (grasses and legumes), which must be monitored during the dehydration process. In the project, forage species adapted to the climatic conditions of the region, such as Massai grass, Zuri grass, and native alfalfa, were used.

To improve this technique, the extension workers were trained and qualified by the project coordinator, who became able to act in the guidance of partner rural producers in each extension action. Before the implementation of hay fields, a flat, clean place with good drainage capacity must be chosen. In each selected area, a sample was collected for later analysis in a reliable laboratory.

The soil in the chosen area must be prepared for planting. For this purpose, soil samples are collected for laboratory analysis, verifying their physical and chemical characteristics. It is recommended to control the pH (6.0–7.0), fertilize phosphorus and potassium, and control invasive plants and weeds (SILVA et al., 2022). The results of the analyses were obtained from the samples collected and analyzed.

At the time of sowing, the density and spacing between plants are considered, which may vary according to the species. For alfalfa, 15–20 kg of seeds/ha is recommended (EMBRAPA, 2021). After the implementation of the hay field, the emergence of seedlings should be observed, and the growth curve should be monitored to estimate the mass production (natural matter) at the time of cutting.

The first cut of alfalfa was carried out when the plants reached 70–90 cm in average height, and 10% of the plants had imminent inflorescence or already had open flowers, whose cut must meet the technical recommendations of a residual height of 7–10 cm to preserve the crown of the base of the plant, in the case of alfalfa, and allow regrowth (MOREIRA et al., 2020). For cutting, cleavers and reapers were used as cutting tools to prevent damage to the base of the plants. After cutting, the extension fellows advise that the cut material should be spread and raked in the hay field, or in a clean and dry place, exposed to the sun so that there is uniform drying, reducing the moisture content, seeking to reach 15% to 18% moisture and avoiding losses due to unwanted fermentation.

To test the quality of the material produced, tests were carried out to determine the ideal hay point for storing and baling.

The salt method consists of placing a small amount of the material in particles up to two centimeters in a glass jar with salt, mixing and checking if the salt has adhered to the particles of the plant; if not, the ideal point has been reached. The other test is based on twisting and a small amount of hay, and if there is no moisture between the leaves and dry stalks, the point is ideal. After making the checks, the extension workers prepare the baling machine to start processing and perform the hay baling. Once ready, the bales should be stored in a covered, ventilated shed that is free of moisture, dirt and insects so that the quality of the hay can be preserved.

The scholars and volunteer extension workers disseminate this forage conservation technique to rural producers, as well as schedule and hold face-to-face and virtual meetings in real time, addressing relevant topics in the hay scenario in the region, such as input prices, supply and demand. As promotional materials, folders and booklets are produced in PDFs to serve as guides for hay production.

Events are held with the objective of disseminating results, in which lectures are scheduled for the internal audience of UFR, considering the importance of haymaking for the production of roughage feed for animal supplementation, with the participation of students, technicians, zootechnicians and professors of agricultural sciences.

In addition to the technical procedures described, the project has an extension character, directly involving the students of the animal science course/ICAT/UFR. Students participate in all practical steps, from collecting soil samples and implementing hayfields to monitoring the harvest, drying and storage of the material. This active participation contributes to the improvement of academic and professional training, providing real field experiences, direct contact with rural producers and the application of theoretical knowledge acquired in the classroom.

The actions developed at Estancia Kratcsh and at Sítio Nossa Senhora Aparecida first involved choosing the area for the implementation of the hay field, which was a showcase unit with the partner property and demonstration field, where we preferred flat areas and had access to water for irrigation, as indicated by the producer, and then, soil collection was carried out on both properties.

With the results of the soil analyses, scholars have evaluated strategies for making more assertive decisions to define the dosage of products for the correction of soil pH, for example, what type of fertilizer is needed for each property. These partner properties must produce and store hay as a source of food for their animals; they are also able to sell surplus hay, adding value to their product and increasing income on their property.

Producers actively participate in the training and technical monitoring stages and are guided by extension workers (students and

teachers) on the appropriate use of the recommended technologies. With this, the project seeks not only to generate applied knowledge but also to promote the autonomy of producers in the production of quality roughage, reducing costs and strengthening the sustainability of regional livestock.

The main objective of each action was to meet the demands of local rural producers, offering technical support and encouraging the use of sustainable fodder production practices, in line with the Sustainable Development Goal (SDG) "Zero Hunger and Sustainable Agriculture". Thus, the project contributes both to the advancement of the academic training of students and to the socioeconomic development of the communities involved.

Results and discussion

The extension workers involved in the project provide technical assistance and services to the project's partner producers. With this, there is the dissemination of the technology learned at UFR, whose properties served have their own hay fields monitored and producing quality food for the existing herds in them. The project has been recognized by rural producers, UFR graduates, and students from other courses and has aroused interest in the entry of volunteers. The coordinator and advisor of the FENAÇÃO project has been able to insert the participation of students in events of agricultural machinery aimed at haymaking, disseminating the technology developed by the project in events and exhibitions, such as Exposul, and, in the "1st Horse Week of Rondonópolis", where lectures and practical demonstrations were presented by extension scholarship holders to promote and disseminate the technology of hay production to equine breeders and students of agricultural sciences, since hay is one of the main foods provided to these animals.

Final considerations

All the work developed in this project is carried out not only to enrich the knowledge of scholarship holders and students within the university or to develop practices at UFR but also to take it to other people who need this support and depend financially on animal production as a source of income. Therefore, transmitting knowledge and presenting viable alternatives for rural producers is extremely important for them to develop sustainability on their property.

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