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**INTENSIVE CATTLE RAISING REQUIRES CULTIVATED PASTURE**

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*"It is necessary to break old paradigms, such as the belief that the grass is not an agricultural crop and can be managed only by the laws of nature".*

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The Brazilian livestock, by training and tradition, it expanded in the extensive system, and for a long time established in native pasture. Until the second half of the last century the country had no information consistent agronomic on grasses tropical used in Brazil. The knowledge about them was much more empirical, in which the "fad" the species planted had predominance among cattle breeder. There was more information on temperate grassland, as the perennial azevem.

The tropical grasses have as particularity the elongation of stems that are corresponding to the stems of these plants, they are little smoothies in relation to the leaves and disturb the forage intake by the animal; and more, the protein content is low, causing the production of meat and milk is more slowly or less than the genetic potential of the animal. From the last two decades of the last century this scenario in animal husbandry national has changed with the advancement of research in pasture in all Brazilian biomes.

According to estimates of the Embrapa Gado de Corte there are already over 120 million hectares of cultivated pastures in the country (the remaining area is of native pastures), where have approximately 170 million of bovines. The growth and

modernization of the Brazilian livestock have broadened the links in this chain, is the case of seed production of forage crops. This link has already meets a demand of approximately 60 thousand tons of seeds and moves R\$ 1.2 billion. What once was, and still is for a good part of the Brazilian cattlemen, an empirical practice, i.e., the sowing of grass, takes more and more the direction of a rational cultivation – cultivated pasture – mainly by the meaning that the economic value and the technology used print to this segment.

Cultivated pasture still is a new concept for the Brazilian cattle rancher, but that will have to be built into your vocabulary and also the productive system. This change has occurred from the 1970s with the dominion of the *Brachiaria* sp, productive grasses and naturally adapted to tropical conditions, which allowed cattle occupy vast tracts of land of low fertility in the Midwest, and Amazon.

The searches with cultivated pasture come by drawing a new "wave" of hybrid grasses associated to modern technological tools: seed, planting, pest and weed control, fertilizer and biorreguladores and food planning. It is the grass becoming a farming, which transforms the rancher of cattle farming in bales of grass. To see each one of these tools.

#### The Seeds of Forage Crops.

Grasses more traditionally sown, mainly in the fields of central Brazil and São Paulo, from the 1940s were: the Jaraguá grasse (*Hyparrhenia rufa*); and the Colonião grasse (*Panicum maximum*). The Colonião had the primacy in the sowing of the first pasture land planted in the Amazon, in the municipality of Paragominas (PA), in the late 1950s, the 1960s and the first half of the 1970's. The prevailing "fad" of forages, brought by the empirical knowledge of cattle ranchers who here if installed.

It began to be replaced, from the 1990s, for procedure already accepted in agriculture, i.e., the choice of cultivar to be planted, following the technical guidance from a specialist, based on a previous study in environmental conditions where the property is located, with assessment of climate, soil, pests and diseases of concern in the region, goals of the farm, among other factors.

The improvement of the grasses began by selecting classical based on materials available in nature, however this technological alternative lies with few alternatives, then the output is the hybridization, a virtually untapped. According to the researcher of the Embrapa Gado de Corte, Cacilda Borges Valle, *"the interest in hybridization is a natural consequence of the evolution of the livestock sector, whose*

*great challenge today is to produce more in a smaller area, for economic needs and environmental”.*

The technological advancement in the segment of fodder was always slow, this is because the extensive cattle as expression increased in this segment is not productive demanded technological advancement, Contributing to inadequate availability of resources for research with forage plants. But the constraints economic and environmental come pressing changes within this framework.

So the market of fodder tends to increase to attend the cattle ranchers that adopt technologies, seeking operational efficiency, cost compatible and guaranteed results, forming productive pasture capable of sustaining high number of animals by hectare. To this new situation, the development of cultivars for regions and specific conditions is increasingly the path to be followed for the launch of grasses in the past two decades. From 2000 to 2016 were released by Embrapa and private companies 17 new cultivars of forage crops.

At the same time the advances in the area of genetic improvement of forage crops and technologies associated with the planting, two other aspects have deserved attention from the search. One is on the level of purity. In less than two decades, 80% of the fodder was out of the standards authorized; today, this percentage is 50% with a tendency to fall further in the coming years, increasing the access of ranchers to quality materials and technologies essential to good formation of pastures.

According to André Peralta da Silva, director of the Department of Supervision of Agricultural Inputs from the Ministry of Agriculture, Livestock and Food Supply (MAPA, acronym in Portuguese), the national standard of purity is 60% for the grasses of the genus *Brachiaria* and 40% for the grasses of the genus *Panicum*. Also, according to him: *"We need to raise this percentage to 80% and 60%, respectively, in bringing more than the default export that is 100% for all species."*

Another technological advance directs to the seeds futurists. In this category are four innovations. **Scarified Seeds**. It consists in removing the skin covering the fodder to break their dormancy and promote the absorption of water and oxygen, contributing to their rapid germination.

**Treatment and Polymer**. These are the application of fungicide and insecticide in seeds with an exchange of colors by polymers, thin films that can help fix these pesticides, favoring its action and avoiding contamination of the environment. They are inert, nontoxic and do not prevent the germination.

**Scaling.** To involve the seeds with materials that increases its size and weight. This makes adjusting the cart, allows you to use fewer seeds/ha, standardizes the planting and reduces losses. Because they are bigger, the seeds are less eaten by birds.

**Inclusion of Bio Stimulator.** Here the seeds are soaked before receiving an enclosure composed of bio fertilizer. These products are a composite of nutrients of high solubility, to stimulate physiological processes and the rooting of the plant.

Technologies of Planting.

For training or renewal of grazing are custom protocols. Instead of a single system for training or renewal of grazing land, common in livestock farming, the focus will be to take into account the regional conditions and even places to define the technologies to be applied.

According to professor Moacyr Corsi, of the Escola Superior de Agricultura Luiz de Queiroz (Esalq/USP), the forage grasses remain productive for only seven years on average. Under the environmental conditions of the Amazon, which favor the growth of weeds, the pastures degrade in five years. *"The rancher can barely write the investment you made in the formation of pasture and now needs to prepare for a reform"*, says the professor. Only with the use of appropriate technologies to the cultivation of pasture is possible to break this vicious cycle and a deficit, giving longevity to pasture and return to production.

The custom protocols, more comprehensive, admit four systems: flat areas; areas with steep incline; wetlands; seeds haul (planting). However, they all assume the characteristics of the area, with an indicator is essential, **the analysis of the soil**. Each protocol presents a list of technologies, ranging from nine to eleven, to be applied to the formation of the pasture. It is obvious that the technical advice is essential to ensure that the protocol is applied correctly as the profile of the area and the local conditions in which it is to be formed or renewed for pasture.

Control of Plagues and Weeds.

Traditionally, the control of plagues, diseases and weeds in the pasture is done by inefficient method by most farmers, i.e., with the use of firearms, harrowing, clearing undergrowth etc.

The plague that most haunts the rancher is the spittlebugs pastures. In their fight is interesting to combine various strategies ranging from biological control, the use of insecticides, and the crop-livestock-forest integration (ILPF, acronym in Portuguese).

The Biological control consists in the application of the fungus *Metarhizium anisopliae*. It should be used primarily in the juvenile phase of the spittlebugs pastures (nymph, which is protected by foam). This fungus produces structures called conidia that penetrate the nymphs attacking them and feeding them, causing his death. Applied at just the right moment (when there is more than 15 nymphs per m<sup>2</sup>) and the environmental conditions (days cloudy, or late afternoon), the efficiency reaches 95%.

Chemical control is done with insecticide that kills the insect adult. This action occurs directly by contact and indirectly through systemic via plant metabolism that poisons the insects when it sucks the lifeblood of vegetation.

The control by ILPF is a research work carried out by the entomologist Rafael Pitta, of the Embrapa Silvipastoril, of Sinop (MT), that has shown that this integrated system helps in the control of the plague, because breaks their life cycle. This is because the establishment of the pasture in this system is more delayed, by modifying the appropriate conditions for hatching eggs of the spittlebug. When the rains return the area is being planted with soybeans. According to his research, there was no need for control of the insect in the area of ILPF studied, unlike the maiden pasture, which presented infestation above 25 nymphs/m<sup>2</sup>, requiring the application of biological control.

For those who don't make ILPF, the most effective and inexpensive is the diversification of pastures. The researcher José Raul Valerius, of the Embrapa Gado de Corte, Campo Grande (MS) recommends the planting of cultivars with load most recent technological, as the *Panicum maximum*, cultivar Zuri; the hybrid of *Panicum*, cultivar Tamani; the *Brachiaria brizanta*, cultivars Xaraés and Piatã.

However, the biggest innovation in control of plague is the integrated management and planning of actions before the gate. In addition to diversifying the pasture, using cultivars that are more resistant, it is necessary to preserve the fertility of the soil so that the grass stays strong, enduring the attack of pests; prevent the grass route from the point of grazing, accumulating much dead material (natural habitat of the Nymphs) and monitor the incidence of insect.

In weed control, known popularly in the Amazon as juquira, the conventional control is done with the use of herbicides (chemical control) or by cleanness manual or

mechanics of the weeds of pasture. The researcher Naylor Perez, of the Embrapa Pecuária Sul, in Bage (RS) created the Integrated Method of Recovery of Pasture (Mirapasto, acronym in Portuguese). This technology is established in four points: control of weeds cells, correction and maintenance of soil fertility, introduction of new forage species, and adjust the bid in pasture. The method is interesting because it combines preventive measures with corrective actions.

The success achieved with the gradual reduction of the infestation, Mirapasto has been tested by producers and researchers from other Brazilian regions, through adaptations. The idea is to make it an official reference of the Embrapa for the combat of invasive plants of pastures in Brazil.

#### Fertilization of the Pastures.

Before focusing on the fertilization of the pastures is important to understand that the soil is a fundamental factor for the sustainability of pasture. The successful development of the forage plant depends of the principal relationships and biotic interactions, and, consequently, the adjustment of the ecosystem - soil, plant, animal - occur in the soil.

In relation to the management of soil fertility in livestock farming this practice virtually nonexistent, and also still has low adherence even in the midst of agriculture. Even the analysis of soil being a simple technology, relatively inexpensive and of strategic importance, it is used by more than 20% of Brazilian farmers. The empirical knowledge still has high weight in the Brazilian agriculture, despite the advance of agribusiness.

Why the fertilization of pastures is increasingly included in "package" of technology training or renewal of the pasture? Because the great challenge of the current livestock farming is to increase productivity, since the expansion of the agricultural frontier, especially for this activity, is practically closed. The rancher has to follow in the footsteps of the farmer.

In agronomic aspect, the fertilization is beneficial because it allows the root system of the plant to grow more, providing itself more robust, water and nutrients, allowing longevity and better nutritional value to the grass. However, this practice has to be done under two basic observations: start without amateurism or "fads" of nitrogen, and have technical advice. The analysis of the soil is the essential indicator of where to begin the fertilization of the pastures.

This subject has been gaining greater amplitude in your application, which will fix the rate of soil acidity by lime and gypsum, passing to the fertilization with macro element, foliar fertilization with micro elements, and biological regulators. It is for this broad framework of options for fertilization of the pasture, the rancher has to be prudent and have technical advice. Researchers in pastures and fertility of soil recommend more studies in this area so that the available technologies can be better validated.

Research has evaluated the technique of biological nitrogen fixation (BNF) in grasses. They work with bacteria of the genus *Azospirillum* sp, that can join the grass, helping him to fix nitrogen and also produce some hormones plants that assist in the growth of these grasses. The expected benefits with the use of BNF in pasture are: providing of course the harvester nitrogen fertilization; improvement in production and quality of pasture; increase in the root system, giving to the pasture greater durability and ability to capture water in the soil.

Pastures fertilized, well managed, and supplemented animals result in better body condition of females, with a direct effect on reproduction and, therefore, the acceleration of the swing of the animals on the farm, triggering a short cycle of production as desirable and necessary in modern farming.

#### Food Planning.

The harvest of pasture by animals is still poorly done by most cattle ranchers, this is because the producer insists on managing grazing with rates of overcrowding and above the ability to support – much grazing – now below the ability to support – low grazing.

The adjustment of the forage supply to the flock, in order to avoid the lack during the dry period and the loss in the wet season is an important strategy for avoiding the “elastic” animal - Fattening during the rainy season, and lose weight at the dry time – Going to the slaughter with 48 months; And if you can reach the animal 777 - gain equal to 7@iln stages of calf, bullock and fattening respectively – going to the slaughter with 21 months weighing over 300 kg. This planning part of the balance between supply and demand for forage for the herd. For livestock farming is a challenge unbridgeable.

It is recommended that it be done month by month, allowing show the duration of periods of deficit and surplus forage, what helps in making important decisions in the management of the farm: alimentary supplementation of the flock; sale or purchase of

animals; ensilage etc. Two calculations are needed, the forage supply and consumption of animals.

For the first has the technique of the square. With a square with a meter of area is played randomly on pasture at various points, this allows with the cut of the grass in that square, and after weighing and drying of grass is the benchmarking of the quantity of dry matter content available to the flock. Another option is to make the visual assessment, with notes from 1 to 5, each associated with a particular offering of dry matter, although it is less reliable. A third alternative is to do the calculation based on the height of the pasture, which has a high correlation with the weight of the forage (each point corresponds to an amount of grass). This technique is interesting to measure the supply in large areas.

How many the consumption is necessary to estimate the evolution of the flock (deaths, sales, purchasing, pregnant cows, calves actually born etc) by category animal – cows with calves at foot, calves from 8 to 12 months bullocks from 13 to 18 months, ox until 36 months. In relation to the daily consumption of forage for the animal, according to the category, on average is 1.5% to 3% of live weight.

We conclude that the cultivation of pasture depends on the use of technologies, and the positive cost-benefit ratio for the rancher. Integrates the search for sustainability in livestock farming, where the equilibrium level of production is complex, because interact two organic components: the grass and the ox. However, not impossible.

The cultivation of the pasture behind as environmental benefits the plant cover and organic matter to the soil, facilitates the infiltration of rain water, kidnaps CO<sup>2</sup> in the atmosphere and prevents deforestation. And more, studies indicate that the increase of only 20% in productivity of pastures in Brazil meet the demands of the country over the next 30 years.

However, it is necessary that the credit lines directed the restoration of degraded areas are available in a fast, with interest and time frame compatible with the activity, and also that the technical support if you do this.

A good example to lead the rancher to be a cultivator of pasture comes from Mato Grosso do Sul with the State Program of Recovery of Degraded Pastures, called Good Land. It is based on five points: mobilization and training, technical assistance, financing, tax incentives and infrastructure. The tax incentive provides the exemption of 33.34% of the tax due for dispatch operations of beef cattle in the properties and which



has been caused by the increase in productivity in areas recovered. The program was launched in March 2016.

The extensive system of creation is no longer viable for two factors: i) it does not provide adequate income, ensures production of only 3.2@/ha/year compared to 12.1@/ha/year of intensive system; ii) the policy of preserving natural resources and increasing environmental awareness in society do not admit more the extensive system of creation.