

## NO-TILLAGE FOR PASTURE RENOVATION IN THE AMAZON

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Productive and well-managed pastures, besides ensuring the profitability of livestock activities, protect the soil against erosion and compaction, maintain their biological activity and increase the levels of organic matter and carbon in the soil.

Pasture degradation is a persistent problem in Brazilian livestock and will only be solved when the rate of recovery and reform exceeds the rate of degradation. Traditionally, degraded pastures are improved by planting forage in soil prepared with plows and harrows. However, this process increases the vulnerability of the soil to erosion, especially in areas with fragile soils or in sloping terrain. In the Amazon, due to the rainy climate, this risk is even greater, impairing future pasture productivity.

No-tillage can be a solution to this problem. However, in Brazil, despite the development of this technology having evolved greatly in agriculture since the 1990s (DENARDIN et al., 2008), there has still been little researched regarding its use in improving pastures.

In 2011, Embrapa Acre, together with CNPq as funder and the Research Support Foundation of the State of Acre (FAPAC), began developing no-till techniques for renovating degraded pastures in the Amazon (Table 1). Together with rural producers, three modalities of no-till planting were developed for pastures: broadcast seeding, row seeding, and no-till planting of stolons. These practices began being disseminated in 2014 through technical publications, lectures, field days and courses held in Acre, Amazonas, Rondônia and Mato Grosso. Adoption has been growing, according to reports from trained technicians and ranchers.

and increasing the seeding rate to compensate for the lower efficiency of seedling emergence;

- Sequential desiccation, with two applications of the herbicide glyphosate (30-40 days and 5-7 days before seeding), has been shown to be very efficient in reducing the volume of straw and increasing the efficiency of weed control;
- Broadcast seeding is suggested when there is no line seeder or when its operation is impossible, such as in sloping areas or on rocky soil. Demands higher seeding rate to compensate for lower seedling emergence efficiency. It has been adopted by small and larger producers. Small producers desiccate vegetation using backpack sprayers and Personal Protective Equipment (PPE) kit and manually distribute the seeds and fertilizers over the straw. Large farms seed the grass using agricultural planes;
- The main plus of directly planting seedlings is it saves time and money with soil preparation operations and demands less seedlings while offering better traffic conditions in the area on rainy days. The reduction in tractor operations reaches 36% when compared to the traditional method, in which the seedlings are spread over the previously harrowed ground and subsequently buried with a leveling harrow and a roller-compact; and
- In direct seeding, the reduction of mechanized operations is even greater: 58% in no-till row seeding and 74% in no-till broadcast seeding.

### RESULTS

- In no-till, excess straw makes sowing difficult and impairs the establishment of forages, which have small seeds and more fragile seedlings than agricultural crops (MASTERS et al., 2004). This was solved by previously managing the vegetation and adjusting the desiccation technique to reduce the volume of straw,

**NEXT STEPS AND RECOMMENDATIONS**

- The challenge now is to make these techniques more visible and to reduce farmer's perception of risk;
- "In Brazil, there is a limited number of models of row seeders configured for no-till pasture renovation. In addition, the performance of some models is still poor.
- No-till planting of stolons represents an improvement over traditional methods, but there is still a lot of room for improvement. The Brazilian agricultural machinery industry needs to explore better the immense potential of a sector that occupies 160 million hectares in the country, and which has been forced to use improvised implements for vegetative planting of pastures.

**DATA PUBLISHED IN:**

ANDRADE. C. M. S. de; ABREU. A. de Q.; ZANINETTI. R. A.; FARINATTI. L. H. E.; FERREIRA. A. S.; VALENTIM. J. F. Plantio direto a lanço dos capins Xaraés e Piatã no Acre. Rio Branco: Embrapa Acre. 2015. 13 p. (Comunicado técnico 188).

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Continuação no Anexo

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**Table 1:** Main positive and negative aspects of conventional and no-till pasture planting

Aspects	No-till	Conventional planting
Saves time, labor and fuel spent with mechanized operations	+	-
Requires less investment in herbicides, insecticides and nitrogen fertilizers	-	+
Allows greater flexibility in terms of planting time	+	-
Keeps the soil structured and firm, protected by straw, reducing the formation of mud during first grazing	+	-
Makes the ground more uniform for mechanized forage harvesting	-	+
Allows you to use the pasture that will be reformed during the dry season before renovation	+	-
Is less complex during the different stages of pasture renovation	-	+
Reduces problems with insects, mollusks and fungi	-	+
Buries the weed seeds that are on the surface of the soil	-	+
Allows greater erosion control	+	-
Maintains soil organic matter	+	-
Improves soil water availability for germination and seedling emergence	+	-
Is suitable for steep or rocky areas	+	-
Is suitable for pastures infested with woody weeds	-	+
Reduces atmospheric CO <sub>2</sub> emissions	+	-

Source: Hampton et al. (1999); Leep et al. (2003); Ferreira et al. (2006); Hall e Vough (2007); Baker e Ritchie (2007); Andrade et al. (2015a); Andrade e Ferreira (2019).

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