Integrated crop-livestock-forestry systems: a Brazilian experience for sustainable farming

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Background

- Agroforestry, silvo-pastoralism, and agro-silvo-pastoralism are means to increase food production while simultaneously providing valuable ecosystem services.
- Such systems halt and revert widespread land degradation, improve and diversify the range of farm products, and safeguard biodiversity.
- Brazil has pioneered some important agricultural technologies in the world, as the no-tillage system, which allows two harvests a year in many parts of the country.

Objective

- Intending to contribute information regarding such integrated systems, a publication was produced by the Brazilian Agricultural Research Corporation – Embrapa.
- Titled “Integrated Crop-Livestock-Forestry Systems” it is a richly illustrated, 282 page book, with 20 chapters involving many scientists from different institutions, approaching the major themes related to the subject, addressing technologies available and their potential for further improvement and expansion.

Overview

- Concepts and initiatives for sustainable agriculture
- Integrated Systems: Advantages and limitations
- Crop-livestock-forestry integration and progress in Brazilian agriculture
- ICLF systems and innovation in Brazilian agriculture
- Entrepreneurship for sustainability with ICLF
- Integrated crop-livestock systems to recover degraded pastures
- Fundamentals of ICLF systems with Eucalyptus trees
- Planning tools for crop-livestock-forestry integration
- Forage grasses in integrated cattle production systems
- Tree species in integrated production systems

Content Samples

Economic advantages of ICLF

- Increase in total yield per unit area
- More efficient use of labour
- Reducing per unit costs of outputs
- Increased profits as result of higher yields and lower profits
- Better distribution and diversification of revenue throughout the year, generating a more balanced cash flow
- Risk mitigation in production and prices due to diversification

Establishment of an ICLF system

Soybeans crop in an ICLF system under implementation, with newly planted eucalyptus in single rows.

Cultivation scheme of an ICLF System

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1. Soil preparation (Tillage, Lime, Fertilization)
2. Soy beans cultivation
3. Planting Eucalyptus while soy beans grow (22 m distance between rows and 1.5 m between trees)
4. After soy beans harvest, sorghum or maize is sowed under no-till system in combination with Brachiaria grass
5. Maize/Sorghum harvested – Brachiaria is kept as surface residue for next soy beans, no-till seeding
6. Soy beans cultivation over Brachiaria using no-till system
7. Brachiaria grass is kept for several years as pasture among the trees (Stocking rates are adjusted according to biomass production)
8. The half of the Eucalyptus trees (every second row) is harvested and sold as fuel wood (providing more light for the next cash crop as integrated cultivation)
9. The rest of the trees are harvested. A new cycle begins...

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