

with a rotation time of 10 years or less. However, because of the exponential increase of interest on initial costs of plantations, natural regeneration is the best strategy for long-term management, especially if values such as erosion prevention and recreation are considered. For management strategies with a rotation time of 20 to 40 years, hardwood plantations may be good.

59. BURN QUALITY PREDICTION FOR SIMULATION OF THE AGRICULTURAL SYSTEM OF BRAZIL'S TRANSAMAZON HIGHWAY COLONISTS FOR ESTIMATING HUMAN CARRYING CAPACITY

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High variability in burn quality of agricultural fields is critical for crop yields among pioneer settlers occupying 100 hectare lots in Brazil's Transamazon Highway Colonization Area near Altamira, Para. Prediction of burn qualities, using clearing and burning dates and weather information, forms a part of a larger simulation of the colonists' agroecosystem for estimating human carrying capacity, and particularly the importance of variability in crop yields on carrying capacity. Colonist pioneer agriculture has been largely based on annual crops such as upland rice, maize, beans, cow peas, and manioc; perennial crops and pasture are now increasing. Burn qualities of both second growth (at least 8 months uncultivated) and "virgin" forest (uncleared by recent Luso-Brazilian colonists) are predicted using discriminant analysis from precipitation, evaporation, and insolation between cutting and burning, and from precipitation in the 15 days prior to burning. Simulations use two burn categories : good

and bad, condensed from a more complete 4-level burn taxonomy. Virgin burn prediction discriminant function correctly classifies 74% of 247 cases; second growth discriminant function correctly classifies 65% of 54 cases. Weather patterns, also modeled in the carrying capacity simulations, are highly unpredictable, making poor burns a major agricultural problem and an important factor affecting human carrying capacity.

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