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Liana Loads in Brazil Nut Trees in the Western Brazilian Amazon

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Brazil nut (*Bertholletia excelsa* H.B.K.) is a long-lived emergent, distributed throughout much of the Amazon's *terra firme* forests, and lianas that climb this forest dominant are in a superior position for accessing light. However, traditional ecological knowledge expressed by local extractivists asserts that lianas negatively impact Brazil nut yield. We investigated Brazil nut-liana relations in a 420 ha forest located in Extractive Reserve Chico Mendes in the Western Brazilian Amazon. Our objectives were twofold: (1) To determine the relationship between Brazil nut crown vine loads and vine origin, number, and basal area; and (2) To determine the relationship between vine loads and Brazil nut tree fruit and nut yield, diameter growth, and crown form, position and area. One hundred and forty reproductively mature trees (≥ 50 cm dbh) were studied, representing four crown liana load categories: (1) no lianas; and (2) $\leq 25\%$, (3) 25 to 75%, and (4) $>75\%$ crown covered. To further explore lianas on each tree, vine origin, number, basal area, and family-level taxonomy were assessed. Fruit and nut production were quantified in 2002 and 2003, and diameter growth was measured for two consecutive 12-month periods. Liana loads were explained by both vine basal area and number of vines ($P \leq 0.0001$), and 90% of the associated lianas originated within 10 m of the trees. Almost half of the lianas were within the Bignoniaceae family. Trees with $>25\%$ of the crown covered with vines produced significantly fewer fruits and nuts than trees with $\leq 25\%$ of the crown covered. Trees peaked in production at approximately 150 cm dbh, and those trees with perfect and good crowns produced significantly more fruits than those with tolerable, poor or very poor crowns. Average number of fruits produced per tree was not significantly different between years (69.6 and 71.4 in 2002 and 2003, respectively). Unexpectedly, trees with no lianas present in the crown and those with the most ($\leq 75\%$ of the crown covered) demonstrated the best growth rates. Liana loads were not significantly correlated with crown position or size, but trees with heavy liana loads had crowns with the poorest forms. Results suggest experimenting with liana cutting as a possible treatment to enhance nut yields.

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