region. So, our objectives in this paper are to present the results of spacing and soil preparation in a 3-year-old *Eucalyptus grandis* x *E.urophylla* plantation. To study spacing, a Nelder design trial was planted with stocking ranging from 228 to 7,150 trees/ha and soil preparation was evaluated in a trial with three levels of soil preparation: pitting and subsoiling at 30 or 60 cm depth. Traditional stocking rates for Brazil, ranging from 1 000 to 1 500 stems/ha, resulted in 15% mortality, which increased to 100% when stocking rate increased. Complete survival was achieved with <800 trees/ha. The effect of soil preparation intensity also differed from the traditional region, with a positive effect on survival and initial growth with increasing subsoiling depth. Results indicated that in this region, where water is the main constraint of wood growth, silvicultural practices must be studied and adapted with a focus on water relations.

Testing a silvicultural recommendation: Brazil nut responses 10 years after liana cutting. Kainer, K. (*University of Florida, USA; kkainer@ufl.edu*), de Oliveira Wadt, L. (*EMBRAPA, Brazil; lucia.wadt@embrapa.br*), Staudhammer, C. (*University of Alabama, USA; cstaudhammer@ua.edu*).

Although liana cutting benefits for tropical timber management have been documented, benefits for non-timber forest product (NTFP) management have not. We tested the silvicultural recommendation that lianas should be cut from Brazil nut trees (*Bertholletia excelsa*) to improve host tree fecundity and thus, commercial nut yields. Our 10-year experiment was conducted where local harvesters collect Brazil nuts as part of their forest-based livelihoods. We cut 454 lianas from 78 of 138 host trees ≥50 cm DBH. Treated trees were better producers 3.5 years after liana cutting, and by years 9 and 10 produced three times more fruits than untreated trees. Number of lianas rooted within 5 m of the host tree explained production levels, suggesting both above- and belowground liana competition. Once host crowns were liana free, branch regrowth was highly visible, and crown reassessments suggested that liana cutting improved crown form. Liana cutting may induce non-producing trees to become producers and may circumvent mortality of heavily infested trees. Only lianas associated with Brazil nut trees should be cut to conserve liana ecosystem functions. Liana cutting could be applied to other tropical trees to boost NTFP fruit and seed production and increase host tree fecundity.

Eighteen years of post-logging recovery in a mixed dipterocarp forest Sabah, Borneo: evaluation of modified RIL and climber cutting. Lussetti, D. (*Swedish University of Agricultural Science, Sweden; daniel.lussetti@slu.se*).

Commercial logging is a driver of rainforest degradation in Sabah, Borneo. Destructive felling and log extraction techniques together with short rotations cause disruption to stand structure and long-term timber yields of natural tropical forests. Since the residual stand is relied upon to produce future yields, reduced impact logging (RIL) methods need to be evaluated. By reduced impact logging, we mean implementation of a series of pre- and post-logging guidelines designed to protect residual stand from injury, minimize soil damage, and protect critical ecosystem processes. The experiment compared two types of logging (with and without pre-climber cutting): conventional selective logging (CL) and supervised selective logging (SL). In SL both pre-marked skid trails and directional felling were implemented. A randomised complete block 2 × 2 factorial design was used, including 20 gross treatment plots, each of 5.76 ha with a central 1-ha net plot. Post-logging data (18 years) showed that almost full basal area recovery had been reached, though with changed species and diameter class compositions. The amount of trees <40 cm DBH had increased, while large trees were reduced. SL reduced establishment of pioneer species (*Macaranga*) compared to CL.

Potential of natural forest production in Sinop County in the Amazonia region, Brazil. Muñoz-Braz, E. (*EMBRAPA, Brazil; evaldo.braz@embrapa.br*), Basso, R., Abreu, M. (*Elabore Ltda, Brazil; elabore@terra.com.br; elaboresinop@gmail.com*), Mattos, P. (*EMBRAPA, Brazil; patricia.mattos@embrapa.br*), Oliveira, M. (*Federal University of Paraná, Brazil; marianaferraz.floresta@gmail.com*), Zachow, R. (*Forest Service, Brazil; randolfzachow@hotmail.com*).

The timber sector is very important to the state of Mato Grosso, Brazil, especially for Sinop County, as timber production is the main source of employment in the region. This paper analyzed two forest sites, 50 ha each, that were logged 6 years ago. The current composition of the forest was assessed by a new census. Extraction scenarios were simulated to identify the potential cut rate by a matrix model. The growth values of the five most abundant species were supplemented with growth rings measurements, obtained by dendrochronology. The commercial potential of trees with a diameter at breast height ≥50 cm was 60 m³/ha. A minimum of 50% of the commercial stock should be reserved to guarantee future sustainable logging. With well-planned logging, avoiding damage to the forest, an initial cycle of 25 years would be sufficient to recover 30 m³/ha. It was observed that the forest growth was very dependent on the remaining commercial stock. It should be emphasized that fixed wood volume cutting rates and fixed cycles should be avoided by legislation as they are not consistent with the diversity of sites and forest subtypes of the Amazon region.

Growth pattern of *Qualea albiflora* and *Goupia glabra* in Amazon forest, Mato Grosso State, Brazil. Oliveira, M. (*Federal University of Paraná, Brazil; marianaferraz.floresta@gmail.com*), Mattos, P., Muñoz-Braz, E., Canetti, A. (*EMBRAPA, Brazil; patricia.mattos@embrapa.br; evaldo.braz@embrapa.br; alinecanetti@gmail.com*), Basso, R. (*Elabore Ltda, Brazil; elabore@terra.com.br*), Rosot, N. (*Federal University of Paraná, Brazil; ncrosot@ufpr.br*).

The aim of this study was to analyze the growth dynamics of commercial tree species in Amazonian forest in Sinop region, Mato Grosso State, Brazil. Stem discs were collected from *Qualea albiflora* and *Goupia glabra* in a compartment of primary forest. The growth rings series were cross-dated. To determine the growth pattern, six models were tested. The best model was chosen based on statistical results and graphical analysis. The equation that best reflected the growth of *Qualea albiflora* was logistic and of *Goupia glabra* was Gompertz. From the graphical analysis of the curves from the average and current annual growth, it was observed that there was an optimum production with diameter of approximately 30 cm (51 years) for *Qualea albiflora* and 35 cm (70 years) for *Goupia glabra*. The highest average growth was observed in the 65-cm-class center for *Q. albiflora* (0.8/year) and 25-cm-class center for *G. glabra* (0.5 cm/year). Thus, it can be considered that the diameter class center immediately below the minimum logging diameter (MLD) of 50 cm may supply the timber stock for the next cycle, considering the diameter to be achieved, if it is applied at an adequate cut rate.