bioenergy, quantify its effects on the water balance, and provide policy-makers, land managers, and researchers with unique information relevant for future development of alternative sources of energy.

How much is too much? Katzensteiner, K., Eckmüllner, O. (University of Natural Resources and Life Sciences (*BOKU), Austria; klaus.katzensteiner@boku.ac.at; otto.eckmuellner@boku.ac.at*).

Mountain forest soils derived from calcareous substrates are frequently characterized by high humus content or even consist solely of organic surface layers. The vegetation pools of carbon and sometimes of macronutrients exceed soil stocks. Even selective timber harvesting has been shown to significantly reduce carbon and nitrogen pools of such soils in the long run. Utilization of residual biomass may have negative feedback on future productivity. To provide a tool for the assessment of biomass extraction on humus dynamics and growth, a modeling environment combining site-specific growth and yield models with a carbon balance model has been developed for a study region in the Calcareous Alps (Austria). Empirical growth models have been derived from standard data of the Austrian forest inventory and additional surveys combined with high-resolution digital surface and terrain models, site maps, and soil information. Allometric functions for the assessment of carbon and nutrient distribution in tree components are based on stratified analyses of trees along chronosequences for predominant site types. Soil carbon and nitrogen dynamics are modeled by a simple mechanistic model based on litter/residue input, and empirically determined moisture and temperature sensitivity of mineralization. Scenarios for different harvest intensities are presented.

Carbon, water, and nutrient balances of a *Eucalyptus grandis* plantation in Brazil over 5 years. Nouvellon, Y. (*CIRAD, Brazil; yann.nouvellon@cirad.fr*), Stape, J. (*North Carolina State University, USA; jlstape@ncsu.edu*), Bonnefond, J. (*National Institute for Agricultural Research* (*INRA), France; bonnefon@bordeaux.inra.fr*), Le Maire, G., Christina, M. (*CIRAD, France; guerric.le_maire@cirad.fr; mathias.christina@cirad.fr*), Campoe, O., Hakamada, R., Loos, R., Bouillet, J., Laclau, J.

Eucalyptus grandis plantations in Brazil are among the most productive forests of the world, reaching mean annual increments of about 50 m^3/ha/yr over short (6 yr) rotations. Carbon, water, and nutrients budgets in one of these plantations were investigated through continuous eddy-covariance measurements of water vapor and CO_2 fluxes over a 5-yr period encompassing two successive rotations (2 yr before and 3 yr after harvesting and replanting), with measurements of water table depth, soil water content to a depth of 10 m, and concentrations of nutrients in soil solutions. Before clearcutting, fine roots were found to a depth of 16 m. No seepage occurred below 5 m. Actual evapotranspiration (AET) was approximately equal to annual precipitation (1350 mm). Clearcutting resulted in a strong decrease in AET, a recharge of deep soil layers, and a rise in the water table. By the third year after replanting, the rapid increase in AET supported by the fast expansion of roots led to soil water depletion to a depth of 10 m. Clearcutting turned the forest from a strong C sink (net ecosystem productivity of about 1 tonne C/ha/month) into a C source, but the plantation turned back to a C sink from 7 months after replanting onwards.

Evaluation of invasives species characteristics and rural people's views on introduced species *Prosopis juliflora* (SW.) DC. in dry zone of Myanmar. Than, W. (*Forest Research Institute, Myanmar; waiwaikyaw2007@gmail.com*).

Prosopis juliflora (mesquite) was introduced into Myanmar around the 1950s for dry zone greening. This research evaluated mesquite distribution using GIS, coppicing, soil and climate conditions, seed germination, and chemical composition of thorn and pod. In addition, a questionnaire survey was conducted to collect data on different societies' use of mesquite and their views. Nine villages were investigated in 2012. Four blocks (East, West, South, North) were laid out in each village. Total tree population and height and coppicing of 10 randomly selected trees were recorded in each block. No correlation was found between height, coppicing, and population. Seed germination was 58–73%. Minerals and feedstuffs of dry pod had a suitable composition for cattle although some samples had a less suitable composition than that of other pasture vegetation. Terpenoids and saponins in thorns may be toxic and painful. Soil sandy loam was dominant with mostly high alkalinity and some acidity. Rainfall between 460 and 940 mm and temperatures between 15.9 and 43 °C were observed. Differences in views between occupations (farming, animal husbandry, and forestry) were not significant except for housewife. Expenditures and income from woodcutting; production of charcoal, toddy candy, pots, and kitchen stoves; and brick baking were estimated. Use of mesquite firewood and earnings from these occupations were assumed to be sufficient to support these rural people. Respondents' attitude toward mesquite, "like it for no choice," is the absolute proper answer for inhabitants of the dry zone.

Harnessing green energy from green gold: case study from Peninsular India. Viswanath, S. (*Institute of Wood Science and Technology, India; syam.viswanath@gmail.com*), Renganathan, V. (*PoinTec Pens & Energy Pvt. Ltd, India; pointec94@gmail.com*).

Some of the tropical sympodial bamboo species have high specific gravity and calorific value, which are prerequisites for energy plantations. Such bamboo plantations have an inherent advantage over tree species in energy plantations as the culms can be harvested every year after clump establishment. Pilot studies in Mundurgi and Attebele, Karnataka, in Peninsular India, have shown that intensively managed bamboo species like *Bambusa balcooa* can be a clean energy source. About 1.5 MW of power could be generated from a plantation of around 80 ha through the gasification process. The authors present their clean energy generation model wherein the discarded nodal segments of bamboo are used in conjuction with other fast-growing woody species with high calorific value for power generation, while the internodal segments are utilized for incense stick production. "Biochar," a byproduct of this gasification process, is ploughed back into the soil along with the in situ compost generated from copious bamboo litter to replenish the C stock of captive bamboo plantations. Another byproduct of the gasification process is heat, which can be harnessed for applications like cold storage, chilling applications, and drying of agriculture produce. This holistic carbon negative process presents a unique opportunity for mitigating climate change through carbon sequestration besides generating clean energy.