Biomass production and carbon sequestration in different tree-based systems of Central Himalayan Tarai region

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Biomass, carbon storage and carbon dioxide mitigation potential of plantations of Populus deltoides, Eucalyptus tereticornis, Dalbergia sissoo, Mangifera indica, Litchi chinensis and Prunus salicina were assessed. Being economically viable, such tree plantations are grown by farmers on a large scale in north India. The maximum total biomass (94.8 Mg ha\textsuperscript{-1}) was observed in a 10-year-old D. sissoo monoculture plantation, followed by an 8-year-old P. deltoides block plantation (63.0 Mg ha\textsuperscript{-1}). Carbon stocks ranged from 4.51 Mg ha\textsuperscript{-1} in an 8-year-old P. deltoides boundary plantation to 43.39 Mg ha\textsuperscript{-1} in D. sissoo plantation. The carbon sequestration rate for P. deltoides block and boundary plantations was estimated to be 2.75 and 0.43 Mg C ha\textsuperscript{-1} year\textsuperscript{-1}, respectively. Eucalyptus boundary plantation sequestered 0.84 Mg C ha\textsuperscript{-1} year\textsuperscript{-1} while D. sissoo plantation sequestered 2.73 Mg C ha\textsuperscript{-1} year\textsuperscript{-1}. Among fruit trees, the highest sequestration rate was recorded in M. indica (mango) plantation, with 1.43 Mg C ha\textsuperscript{-1} year\textsuperscript{-1}. 