

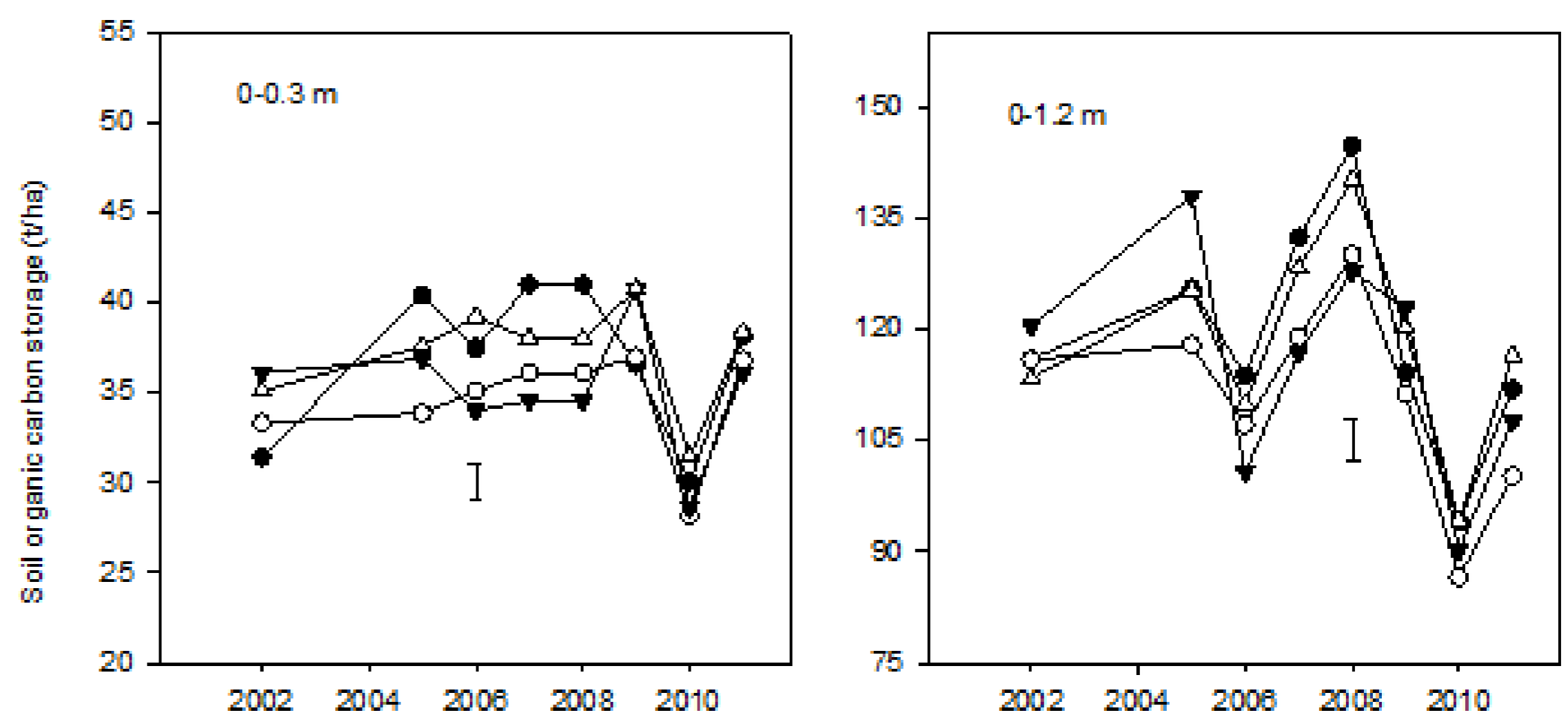
Soil carbon storage in irrigated cropping systems sown on permanent beds

Nilantha Hulugalle, Tim Weaver, Lloyd Finlay, Vili Heimoana
NSW Department of Primary Industries, Narrabri, NSW

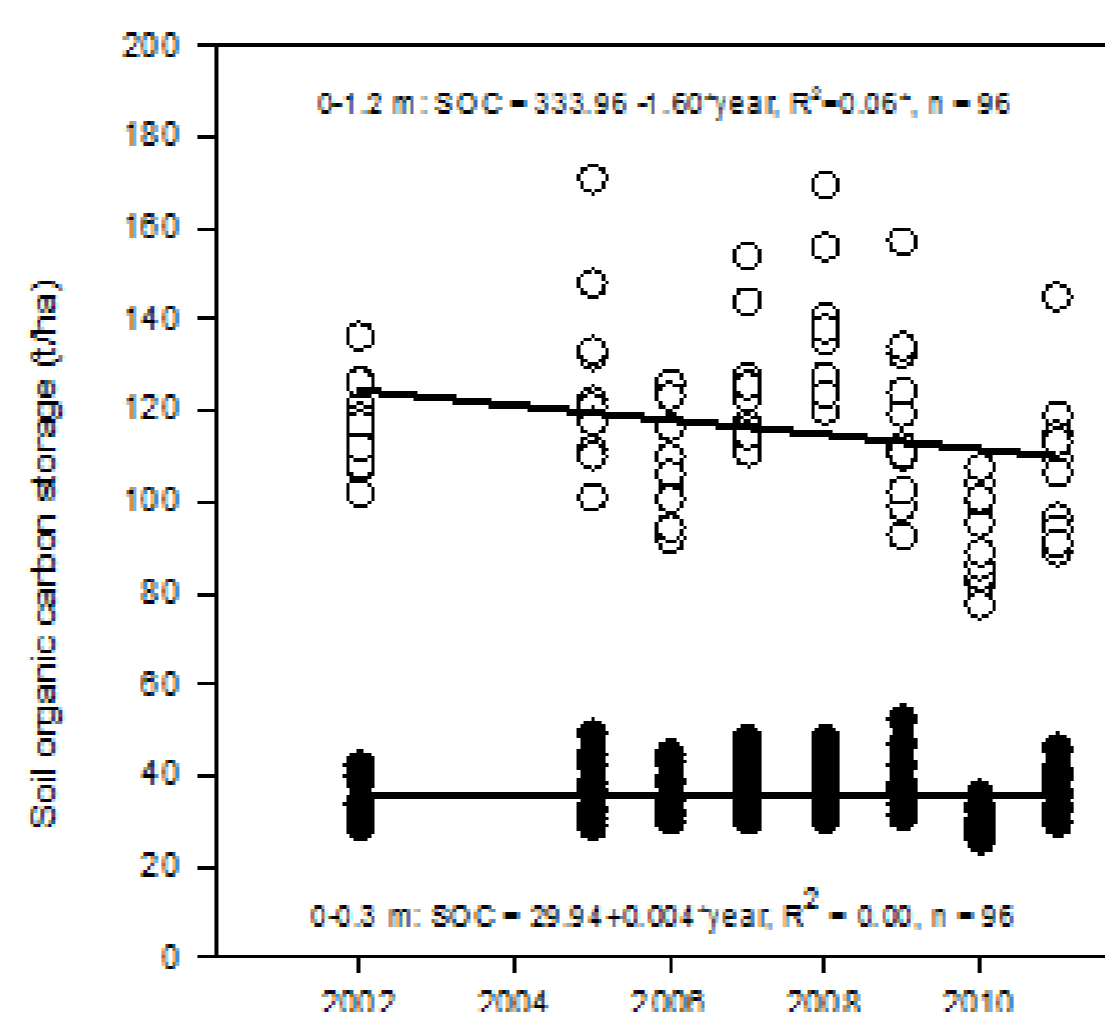
Soil organic carbon storage in four irrigated cotton cropping systems sown on permanent beds in a cracking clay with subsoil sodicity was determined over a 9-year period in a trial near Narrabri, NSW. The treatments were: cotton-cotton (CC), cotton-vetch (CV), cotton-wheat where wheat stubble was incorporated (CW), and cotton-wheat-vetch where wheat stubble was retained as standing stubble (CVW). Vetch was terminated during or just prior to flowering by a combination of mowing and contact herbicides, and the residues retained as mulch. Average carbon storage in the 0-0.3 m and 0-1.2 m depths was higher when vetch was part of the rotation with similar values occurring in CWV and CV. On average, cropping systems that included vetch stored 2.3 t C/ha more in the 0-0.3 m depth and 5.3 t C/ha more in the 0-1.2 m depth than those that did not. These differences correspond to inputs of nutrient-rich biomass. Net carbon sequestration rates did not differ among cropping systems and did not change significantly with time in the 0-0.3 m depth but net losses occurred in the 0-1.2 m depth.



Winter crops in rotation trial, ACRI, Narrabri



Effect of cropping system on variation of soil organic carbon storage with time in the 0-0.3 m and 0-1.2 m depths. ●, cotton-vetch (CV); ○, cotton-cotton (CC); ▼, cotton-wheat (CW); Δ, cotton-wheat-vetch (CVW).



Soil organic carbon sequestration (2002 to 2011) in the 0-0.3 m and 0-1.2 m depths. ●, 0-0.3 m; ○, 0-1.2 m. Lines were fitted by linear regression to pooled data.