



Carbon dioxide and methane fluxes from legumes based rotations under conventional and organic practices

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In this study we assessed the effect of two different rotations based on winter (faba bean) or summer (cowpea) legumes on the direct emissions of CO₂ and CH₄. Faba bean was rotated with the summer melon crop (*Cucumis melo*) while cowpea was rotated with the winter broccoli crop (*Brassica oleracea*). We also assessed if different legume cultivars and management practices (conventional and organic) significantly influenced gas emissions. The study was randomly designed in blocks with four replications, in plots of 10 m², during two complete cycles. Gas samples were taken in different times (0, 30 and 60 minutes) once a week using the static gas chamber technique for each crop. Results showed that cumulative CO₂ emissions in broccoli decreased after the rotation with both cowpea cultivars under conventional management practices. Faba bean cultivars and management practices had no influence on cumulative CO₂ emissions in melon crop. Cumulative CH₄ emissions in broccoli crop were lowest after the rotation with Grey-eyed pea than Black-eyed pea cultivar, under both management practices. However, faba bean cultivars and management practices had no influence on cumulative CH₄ emissions in melon crop. Cumulative CH₄ emissions in melon crop were highest than in the rest of crops. Cowpea cultivar and management practice influenced cumulative CH₄ and CO₂ emissions of broccoli crop, respectively. Faba bean cultivar and management practice had no effect on cumulative CH₄ and CO₂ emissions of melon crop.

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