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Role of Belowground Parts of Green Manure Legumes, *Crotalaria spectabilis* and *Sesbania rostrata*, in N Uptake by the Succeeding Tendergreen Mustard Plant

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Abstract: Using symbiotically N₂-fixing legumes as green manures is a way to supply N from the atmosphere to cropping ecosystems. Usually whole plants of the green manure are incorporated into soil; hence, the belowground parts as well as the aboveground parts would contribute to N transfer to succeeding crops. However, little is known about the contribution of the belowground parts alone. We assessed N transfer from belowground parts compared to whole plants of two legumes, *Crotalaria spectabilis* and *Sesbania rostrata*. Each of the legumes was grown approximately for 3 months in a 1/2000a Wagner pot filled with soil media, and then the roots alone (R) or shoot and root (S+R) were harvested and incorporated in the pots. Tendergreen mustard (*Brassica rapa*) as the succeeding crop was grown for 66 days in these pots without additional fertilizer. Although the amount of N in green manure in S+R pots was approximately 4-fold higher than that in R pots, differences in N uptake by tendergreen mustard between the S+R and R pots were smaller (1.7-fold for *C. spectabilis* and 2.3-fold for *S. rostrata*). This means that N recovery rate by tendergreen mustard was significantly higher in R than in S+R pots with either green manures. Differences in C/N ratio of the green manures could not likely explain the higher N recovery rate in R pots. Bioassay of the aqueous extracts from the green manure with lettuce seedlings suggested that growth inhibitory effects might be responsible for the lower recovery rate in S+R treatment.

Keywords: [Allelopathy](#), [C-N ratio](#), [Crop rotation](#), [Nitrogen fixation](#), [Nitrogen starvation](#)

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