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## Legume-cropping and research strategies in Brazil

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Brazil harvested 115 million tons (Mt) of soybean in 2017, of which 67 Mt were exported. Essentially all the N in the grain is derived from BNF indicating that the total N exported from the field as grain amount to approximately 7.7 Mt. The large national production of this crop in response to international demand is largely due to the work done by plant breeders which has produce cultivars adapted to all latitudes in Brazil. The highly-efficient symbiotic N<sub>2</sub> fixation is mainly due to breeding programs always conducted with selected rhizobium inoculants and without N fertilizer application. Similar breeding programs to improve grain legume yields for *Phaseolus* beans (*P. vulgaris*) and cowpea (*Vigna unguiculata*) have also led to improved grain yields through improved resistance to disease but for *Phaseolus* beans grown in the lowland tropical areas N<sub>2</sub> fixation inputs are often unreliable owing to the poor adaptation of this crop to warm humid climates. Other research on legumes in Brazil has led to the use of fast growing legume trees for the recovery of degraded areas or for recuperation of areas left over from mining operations. Recently, in response to concerns over greenhouse gas emissions, there has been a revival of interest in the introduction of foraged legumes in tropical (*Brachiaria* spp.) pastures. Such legumes must be carefully selected to permit their persistence in the sward and pasture management has been shown to be critical in this respect. The possible impacts of the introduction of legumes in these systems on GHG emissions will be discussed.