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Cover Crop Cocktails as N and P Source in the Brazilian Semiarid

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Many studies have shown the benefits of the single cultivation, but the value of varied cover crop plant cocktails has received less attention. The objective was to evaluate the availability of N and P by plant cocktails used as cover crop and green manure in the semiarid. The treatments were arranged in four blocks in a split-plot design with two soil management systems (tillage and no-till) and three cropping systems (Plant Cocktail 1 - 75% legumes + 25% non-legumes; Plant Cocktail 2 - 25% of legumes + 75% non-legumes; and Natural Vegetation). Fourteen species were included in the composition, comprised legumes, oilseeds and grasses. Dry biomass production and decomposition, nutrients accumulation and mineralization by plant cocktails and natural vegetation were evaluated. Decomposition and release of N and P was monitored by the litterbag-method. Plant cocktails reached a Dry Biomass production ($\sim 9.0 \text{ t ha}^{-1}$) twice higher than Natural Vegetation, essential for adoption of no-tillage systems in the region. Natural Vegetation showed less accumulation of N and P due to lower production of biomass in relation to Plant Cocktail 1 and 2. Dry biomass production and P and N accumulation by Plant Cocktail 1 and 2 had no significant differences. The decomposition of 50% of plant cocktails takes approximately 116 days by no-till system and 100 days by tillage system, showing a small difference between the types of soil management. The 50% of N mineralization occurred during the first 3 months which the higher N release ranged from 163.2 to 171.6 kg ha^{-1} with Plant Cocktail 1, varying with the type of soil tillage. P mineralization was influenced by soil management. Plant Cocktail 2 took 105 days to release 50% of P while no-tillage system took about 135 days. Plant Cocktail 2 released a mean of 29.8 kg ha^{-1} P during the first 3 months by conventional tillage. The use of Plant Cocktail was more effective than Natural Vegetation and proved possible alternative to supply the nutritional demands of N and P for a successional crop.

Keywords: plant mixture, dry biomass, green manure, mineralization rate, macronutrient

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