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The Effect of residue quality on nitrogen release and uptake in wetland rice

A pot experiment was carried out to estimate N uptake by rice from ^{15}N labeled crop residues of Casuarina, Leucaena, Alfalfa, Soy bean and Faba bean. ^{15}N labeled crop residues were applied (Ndfr) was determined using isotope dilution technique. Percentage of Acid Detergent Fiber (ADF), lignin, cellulose, Total Extractable Polyhenol (TEP), total Nitrogen, Atom % 15N excess were determined in all crop residues prior to application. The residues had different chemical characteristics. Casuarinas had the highest cellulose and polyphenol concentration, Faba bean had the highest lignin concentration, and Alfalfa had the highest nitrogen concentration. Dry matter production of the rice was significantly ($P<0.05$) higher in all residue treatments compared with the no-residue control. The yield of Alfalfa treatment was about twice that of the no residue control. Nitrogen derived from residues in the rice crop correlated significantly ($P<0.05$) with the concentration of polyphenol in the added plant residues.

The highest Ndfr was in the Alfalfa residue treatment. The N recovery from the residues was relatively high and in the range of 15-25% of the residue N added.