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Influence of C: N and C: P ratios on rice straw biomethanation in an anaerobic digester

Experiments were carried out at the University of Ruhuna, Mapalana Kamburupitiya during 2001 July to 2001 September to assess the influence of C: N and C: P ratios on anaerobic digestion in rice straw batch biomethanation.

Rice straw with a C: N ratio of 80:1 was amended with urea (46% nitrogen) to maintain C: N ratio at 10:1 to 40:1. After mixing with urea the highest total biogas production of 54.12 liters and maximum methane percentage of 55% were given at 30:1 C: N ratio with 8 days of retention time. The lowest gas production and minimum methane percentage were taken at 10:1 C: N with 23.59 liters and 18.2%, respectively.

Concentrated super phosphate was used to adjust the C: P ratios on biogas production keeping the ratios in between 100:1 to 250:1 while keeping a constant ratio of 30:1 of C: N ratio. The original C: P ratio of rice straw was 331:1. Adjusting C: P ratio to 200:1 ratio produced the maximum gas yield of 54.99 liters with the 5 days of retention time. Maximum percentage of methane also produced at 200:1 while the lowest was given at 100:1 C: P ratio.