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## Analysis of feed value for setting an optimal harvest time of whole crop rice cultivars for silage use

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### Abstract

To set an optimal harvest time of main 7 whole crop silage rice cultivars, Nokyang(Ny), Mogwoo(Mw), Mogyang(My), Jungmo1029(Jm1029), Jungmo1038(Jm1038), Nokwoo(Nw) and Yeongwoo(Yw), based on feed value, we analyzed their feed values such as percent crude protein(CP), crude fat(CF), crude ash(CA), neutral detergent fiber(NDF), acid detergent fiber(ADF) and lignin. It was evaluated every 10 days from heading to 40 days after heading(DAH). Total digestible nutrient(TDN) and relative feed value(RFV) was also calculated from ADF and NDF. As results, CP was generally in decline as increasing DAH in Ny, My, Jm1029, Jm1038 and Yw and decreased to 20 DAH in Mw, decreased after increasing to 30 days in Nw. The CP content of Ny was relatively the highest ranged from 5.3% to 10.1% and Mw the lowest 4.5% to 5.2%, compared to others. CF content tend to decrease as DAH increase in Ny, My and Nw and decreased after increasing to 30 days Jm1029, increased after decreasing to 20 days Jm1038 but was not shown distinct trend of increase or decrease in Mw. Especially, that of Yw's CF gradually increased as harvest time late but relative content the lowest from 1.46% to 2.29% among 7 cultivars. The CA content of Ny, My, Jm1029 and Jm1038 approximately decreased as DAH increased and that of Mw was similar to others after heading, Nw decreased after 10 days and Yw increased after flowering. In all 7 cultivars, NDF and ADF had a tendency to decrease as days accumulated, in particular, Yw was the lowest on 30 DAH and so the content of Yw's TDN the highest(71.5%), while the lowest(67.2%) in Nw. For lignin, particularly, Mw tend to be in decline as DAH increase and was the lowest ranged from 1.34% to 1.87%. ADF analyses allows for the evaluation of *in vivo* digestible dry matter(DDM) and energy availability and NDF analyses provides the best indication of dry matter intake(DMI). Ultimately, the two factors can be combined to derive RFV for forage. RFV in general increased as DAH increased in all cultivars and was in order, Yw>My>Ny>Jm1038>Mw>Jm1029>Nw on 30 DAH. Taken together when these results, despite a slight increase of TDN after 30 DAH except Yw, considering forage yield potential, digestibility of grains and gradual decrease of CP and CF, the yellow ripe stage, about 30 DAH, was appropriate to harvest whole crop rice for silage use.

Keywords: Rice, Forage, Silage, Feed value, Harvest,

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