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Nutrient contents and ensiling characteristics of several rice varieties

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Introduction Rice is one of the major food crops and has gained attention for its use as an animal forage source (Kim, 2005). A problem in the future will be a lack of feed grain, so developing forage crops is very important. Using the whole rice crop as forage is one way of potentially solving feed shortages and breeding new rice varieties will become necessary in order to improve its success. This study investigated the nutrient contents and ensiling characteristics of six rice varieties in order to provide some new materials suitable for the breeding of forage rice crops.

Materials and methods Six rice varieties: Tianyou 998 (TU), Peizaruanxiang (PG), Guixiangnian (GN), Pin 14 (P14), Pin 15 (P15) and Huajingxian 74 (HN), were grown at the experimental field of SCAU, and harvested at the yellow stage of maturity. At harvesting, tiller numbers per plant, plant height and yields were measured. The fresh whole crop rice was chopped at 1-2 cm and ensiled within small film bags. Nutrient contents of the materials prior to ensiling and the silage fermentation quality after being ensiled for 2 months were investigated.

Results The contents of mono-oligosaccharides and CP had no significant differences among the varieties of rice ($P > 0.05$). Peizaruanxiang had the most tillers and the highest height, Tianyou 998 gave the highest yield and Guixiangnian contained the lowest crude ash content (Table 1). There were some differences in pH values of whole crop rice silages between the varieties, with the silages of Guixiangnian and Pin 14 having high pH values (Figure 1).

Table 1 Characteristics of six rice varieties.

	TU	PG	GN	P14	P15	HN	SE
Tillers	8.7 ^a	9.2 ^a	8.9 ^a	7.0 ^{ab}	6.2 ^b	8.4 ^a	1.03
Heights (cm)	112.9 ^{abc}	121.0 ^a	106.7 ^c	104.3 ^c	118.2 ^{ab}	110.3 ^{bc}	3.40
DM (%)	43.0 ^a	36.9 ^c	38.4 ^b	36.7 ^{bc}	34.6 ^d	35.5 ^{cd}	0.006
DM yield (t/ha)	16.8 ^a	14.9 ^{ab}	13.8 ^b	10.9 ^c	14.5 ^{ab}	15.8 ^{ab}	3.11
Crude protein (% DM)	6.70	6.99	7.04	7.92	7.78	8.17	0.005
Crude ash (% DM)	7.88 ^b	7.94 ^b	7.86 ^b	8.16 ^{ab}	8.68 ^a	8.32 ^{ab}	0.002
Mono-oligosaccharides (% DM)	2.38	2.35	2.51	2.75	2.51	2.57	0.268

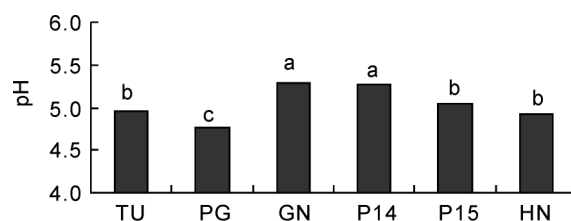


Figure 1 pH values of different whole crop rice silages.

Conclusions DM yield, crude protein and crude ash contents are important parameters for forage rice breeding. Based upon these factors, Tianyou 998 and Huajingxian 74 might be breeding materials for a suitable forage rice crop.

Reference

Zhang JG, Liu XD, Cao ZZ, Yu Z, Lu YG (2007) Current status and perspectives of research and utilization of forage rice. *Proceedings of Symposium on Grassland Science for Chinese youths*, 156-159. Haikou, China. (In Chinese)