RELATIONSHIP BETWEEN DAYS TO FLOWERING AND YIELD COMPONENTS OF *MA WEE* ACCESSIONS IN SRI LANKA

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Introduction
Rice is a globally important food crop. It is one of the most important crops in Sri Lankan agriculture and economy as well. Rice breeders focus on improving yield characters for sustainable rice production. Improved rice varieties in Sri Lanka have already reached the maximum yield potential. Traditional rice germplasm may possess unique genetic relationships among agronomic characters useful for breeding. Utilization of traditional rice germplasm for breeding would be an important attempt to meet higher demand. *Ma wee* was one of the commonly grown traditional rice in the past for higher yields under adverse environmental conditions. *Ma wee* is a photosensitive variety. High yielding *Ma wee* accessions (ACNs) from Plant Genetic Resources Center have been identified and seeds were submitted to Rice Research and Development Institute for further trials for farmer introductions recently. Rice yield is mainly controlled by the genotype, climate, soil environment and management. Yield of rice and plant structure are affected by heading date. Relationships between days to flowering and yield, and vegetative growth had been reported previously in selected Sri Lankan rice accessions under different photoperiods. Identification of relationships between days to flowering and, yield and vegetative growth in one of the major photoperiod sensitive rice variety *Ma wee* would be important in its utilization for breeding high yielding rice for different ecological regions and seasons. Therefore, this experiment was carried out to determine the relationships between days to flowering and yield and vegetative growth characters during non-inductive growing season for flowering (Late Maha season).

Methodology
The experiment was conducted at a field of Akurugoda, Matara, Sri Lanka during late short day season from December 2013 to July 2014. The experiment was conducted with ten *Ma wee* ACNs (5384, 4666, 3598, 6149, 3608, 3625, 3649, 3704, 4435 and 6702) received from Plant Genetic Resource Center, Sri Lanka. The experiment was set in a Completely Randomized Design with three replications. Seedlings were planted in 40 x 40 cm inter and intra row spaces. Basal dressing and top dressing at the tillering stage were applied according to the recommendations of Department of Agriculture, Sri Lanka. Manual weeding was done at regular intervals to keep competition from weeds at minimal.

Water management and insects and pest control were carried out. Data collected from ten ACNs on days to flowering (DF), plant height at vegetative stage (PH), flag leaf area (FLA), total tiller number at vegetative stage(TTN), total panicle weight (TPW) and grains per panicle (GPP). Minitab version 15 (USA) was used to analysis of correlation coefficient.

Results and Discussion

Days to flowering

DF varied from 71±5.3 to 173±2.2 days in selected *Ma wee* ACNs of Sri Lanka. The minimum DF and maximum DF was observed by ACNs 4435 and 6702 respectively. The DF highly correlated with GPP (r=0.65, p=0.04) as indicated in Figure 1b. Regression model developed for the correlation was GPP=34.30+0.34 DF
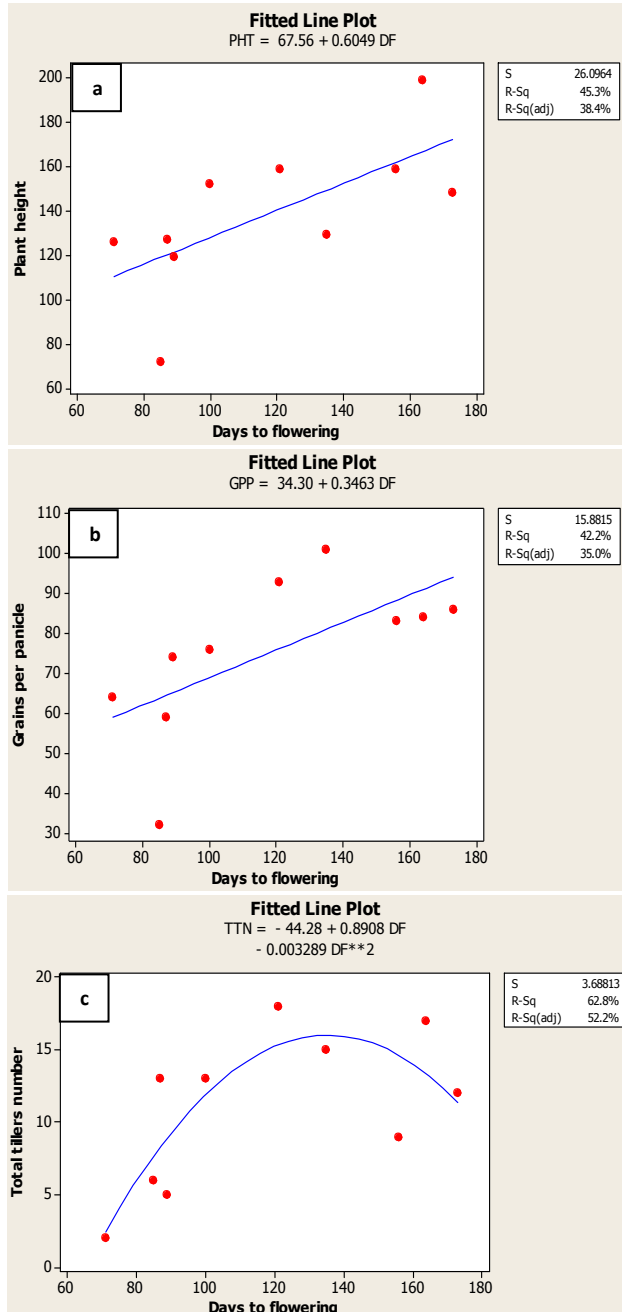

Figure 1. Effect of Days to flowering on Plant height (a), Grains per panicle (b) and, Total tillers number (c).

Plant height at vegetative stage

PH at vegetative stage varied from 72±3.4 cm to 199±4.7 cm. Minimum and Maximum PH was observed by ACNs 5384 and 3704 respectively. There was positive and significant relationship between DF and PH (r = 0.67, P = 0.03) as indicated in Figure 1a. The regression model developed for the correlation was PH=67.56+0.06DF.

Total Tiller Number at Vegetative Stage

TTN at vegetative stage varied from 2±0.2 to 22±0.5. Minimum and Maximum TTN were observed by ACNs 6253 and 6710 respectively. There was positive correlation with DF and TTN. (r = 0.56, P = 0.08) as indicated in Figure 1, c. The regression model developed for the correlation was TTN=-44.28+0.89DF-0.003DF

Flag Leaf Area (FLA)

FLA varied from 35.4± 6.32 to 190 ± 4.23 cm^2. ACN 4666 was significantly different from other ACNs which the highest mean of FLA while ACNs 4435 was significantly different from others with the lowest mean of FLA. Correlation coefficient of selected quantitative traits of *Ma wee* ACNs was determined. There was highly positive significant association of FLA with TPW (r = 0.81, p = 0.004). The results revealed the relationship between DF on yield related parameters. Flowering time is the most important yield trait that could be used to improve rice yield and it is affected by genotypes. We observed many ACNs within one variety showing different DF. Some *indica* rice were extremely late flowering under long-day conditions, in which genetic basis should be revealed.

Conclusions and Recommendations

There were significant positive correlations between DF and GPP, DF and PH, FLA and TPW (*r=0.65*, 0.67 and 0.81) of selected *Ma wee* ACNs at 5% probability level. There were positive linear relationships between DF and GPP, (GPP = 34.30+0.34DF) and DF and PH, (PH = 67.56+0.06DF). There was a quadratic relationship between DF and TTN, TTN=-44.28+0.89DF-0.003DF. These findings would provide useful information for future breeding.

Acknowledgement

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