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YIELDS AND QUALITY COMPONENTS OF MAIZE HYBRIDS FOR SILAGE

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ABSTRACT

Seven maize hybrids were evaluated at Frewens Block, Massey University, Palmerston North to determine the effects of hybrid and plant population on yield and yield components, nutritive value, dry matter (DM) partitioning and N%. The range of maturity of the seven hybrids varied from early to full season. The seven hybrids were P3902, Janna, CF1, Furio P3751, P3585 and CG900 each planted at 75,000; 100,000 and 140,000 plants/ha. Plant height, leaf number and yield were measured at 50% silking. Three subsequent samples were taken for estimation of yield, the final yield being at 30-35% whole crop dry matter %. "In Vitro" Digestibility and Kjeldahl N analysis was done by Animal Nutrition Laboratory, Massey University on the grain, leaf, stem and husk components for the 100,000 plants/ha population only.

The effect of hybrid on crop development was closely related to relative maturity. P3902 and Janna, both early maturing hybrids were quickest to reach 50% silking and blacklayer, followed by medium (CF1, P3751, Furio) and late maturing (CG900, P3751) hybrids. Heat unit accumulation of each hybrid followed a similar pattern. Plant height and leaf number differed significantly among hybrids and was related to maturity ranking.

Hybrid CF1 achieved the highest (20,046 kg/ha) whole crop DM yield at final harvest while Janna produced the lowest (15,776 kg/ha) yield. The 75,000 plants/ha plant population yielded significantly less than 100,000 and 140,000 plants/ha. There was no difference between the 100,000 and 140,000 plant populations. This study confirmed the present recommended plant population of 100,000 plants/ha for maize

silage. Dry matter partitioning at final harvest revealed the highest proportion in the grain component followed by the stem, husk and leaf. Total metabolizable energy (ME) content ranged from 11.3 MJME/kg DM to 10.28 MJME/kg DM. The ME content of CF1 was significantly higher than all other hybrids.

Final yield was not correlated with the relative contribution to yield in any of the components or with N % in the crop. However, total metabolisable energy content was correlated with its ME components in the grain, leaf, husk and stem.

There were no significant hybrid differences in whole crop N % which ranged from 1.07 to 1.16%. Nitrogen % of total DM was strongly correlated to N% in the grain and moderately correlated to N % in the stem and in the leaf. NHI was highly correlated with % grain.

CF1 was the best performing hybrid, having highest yield, metabolizable energy and N %. However, among six commercial maize silage hybrids (CF1 is excluded being a non-commercial hybrid at the time of experiment) tested, P3902, Furio, P3585 are the preferred hybrids for early, medium and full season, respectively. The performance of CF1 suggests that there is considerable potential for improving the agronomic characteristics of maize hybrids for silage production in New Zealand through local plant breeding programmes.

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