

STUDIES ON THE REPRODUCTION OF DAIRY COWS DURING SUMMER

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The Atherton Tablelands in northern Queensland have a tropical upland environment and support a viable dairy industry with the highest per cow and per farm milk production in Queensland. Conception rates in summer are significantly lower than for the cooler months (Tableland Vet. Service 1989, pers. comm.). Data on conception rates for 12 years (1977-1988) for lactating Holstein-Friesian cows and growing heifers on Kairi Research Station were examined in this study. Milking cows grazed Gatton panic pasture receiving low or high nitrogen applications (200-400 (1977-81) or 100-300 (1982-88) kg N/ha.year.) Cows were unsupplemented to 1985 and received 3.5 kg molasses/day thereafter. Growing heifers grazed unfertilised Gatton panic-Tinaroo glycine pasture and were fed nil supplement (1977-80) or 1.5 kg grain/day during the mating period (1985-88). Thirty-two cows and an average of 15 heifers were artificially inseminated during February-March each year. Conception rate refers to the number of animals confirmed pregnant after 3 inseminations.

Factors which directly influenced reproduction were average daily maximum temperature during the mating period, summer rainfall, supplementation and fertiliser applied. For milking cows, conception rate was negatively correlated with average maximum temperature $>26^{\circ}\text{C}$ during the mating period (Fig. 1; $P < 0.01$). For growing heifers, a negative relationship was apparent above 27°C , and an increase in temperature to 28.5°C resulted in a decline in conception rate from 80 to 54% ($P < 0.01$). For cows, summer rainfall and conception rate were positively related up to 1000 mm (80%) (Fig. 2). Conception rate was depressed when rainfall (November-March) was >1500 mm ($P < 0.01$). Molasses supplementation reduced the year to year variation in conception rate. For cows fed molasses, conception rate was higher in the higher nitrogen treatments (80%) than in the lower nitrogen group (57%).

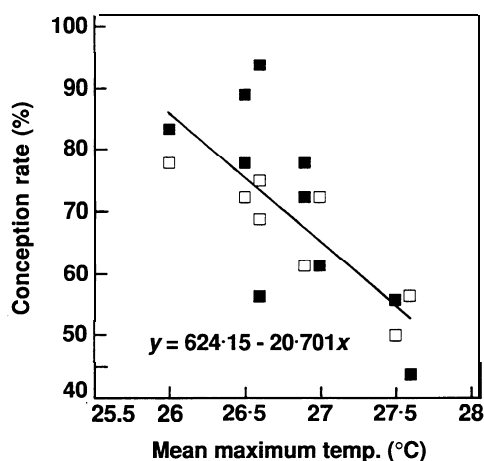


Fig. 1. Relationship between conception rate and mean maximum temperature for cows at 2 levels of nitrogen fertiliser ($\square$ 100 or 200 kg N/ha.year; $\blacksquare$ 300 or 400 kg N/ha.year).

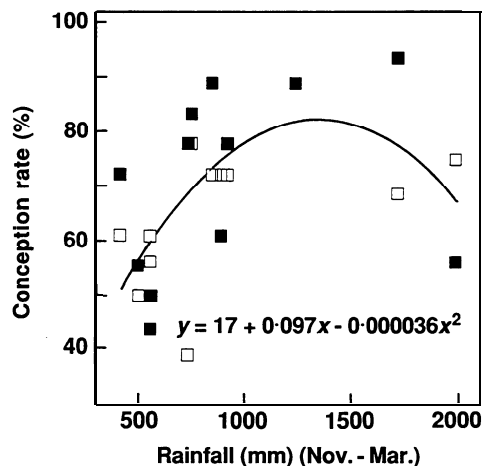


Fig. 2. Relationship between conception rate and rainfall (November-March) for cows at 2 levels of nitrogen fertiliser ($\square$ 100 or 200 kg N/ha.year; $\blacksquare$ 300 or 400 kg N/ha.year).

This study showed there was substantial variability between years in conception rate. This variation was associated with maximum daily temperature and feed supply as influenced by rainfall, level of nitrogen fertiliser and supplementation.