A breeding nucleus has been established at this centre to produce large framed sheep which are adapted to the tropical environment. Sheep from this nucleus are made available to breeding establishments in developing tropical countries and to local producers attempting to breed a degree of diversification into their flocks.

Sheep of Merino (Peppin, non-Peppin and South Australian) and non-Merino origin (Suffolk, Poll Dorset, Border Leicester and Wiltshire Horn) were screened for environmental adaptation traits after a season of acclimatisation. Measurements of rectal temperature, respiration rate and water turnover have been used as a guide to initial screening tests (Hopkins, Knights and Le Feuvre 1977). Subsequent measurements of reproductive performance, wool growth, liveweight gains and mature body size have been made.

Most temperate Merinos, Border Leicester, Suffolk and Wiltshire Horn sheep tested to date have been classed as unadapted. Many of these sheep exhibit a rectal temperature of 40°C and a respiratory rate of 180/min during spring when adapted sheep show no evidence of heat stress. These results are supported by paddock observations where unadapted rams suffer a mortality rate of 5–12% and mark only 35–60% of a spring joined flock, while adapted sheep suffer no mortalities and mark 80–95% of a comparable flock.

The overall performance of the South Australian Merino, large framed tropical Merino (Peppin) and Poll Dorset sheep indicate that these blood lines appear to be the most suited for inclusion in subsequent phases of this study. Hoggetts in this nucleus attained a liveweight of 33 kg at 16 months while carrying medium–strong wool of acceptable quality. These sheep were 10–15% heavier than unselected tropical sheep.

It seems likely that tropical sheep behave like mammals approaching the finite boundary of their natural distribution by exhibiting a poor reproductive performance and a small liveweight. In order to improve the productivity of such animals in tropical areas it is necessary to consider tropical adaptation as an aid to selection. The location of this research station makes it an ideal site for undertaking the selection exercise. Apart from providing rams to local producers who are interested in this type of industry diversification there is every chance that such rams would perform at least as well as the Corriedale stock sent to India as part of Australia's contribution to sheep breeding efforts in that country.