

PROLIFIC BREEDS OF THE WORLD

IV - The Incredible Booroola Merino

Good news for the Canadian breeders who wish to increase the prolificacy of their sheep but can not afford 5 years of quarantine if they import sheep from Europe. An alternative comes from the other side of the world, from Western Australia to be exact. A new strain of Merino sheep which turns some genetic theories upside down. Fortunately this breed can be imported easily into Canada and its effect can be far reaching.

No one should ever underestimate the power of nature. It can turn almost overnight a low-fertility, low-prolificacy breed into a super prolific breed. That is exactly what happened to the Australian Merino sheep, a breed well known for its heavy fine fleeces and equally well known for its low fertility and the almost complete absence of multiple births. To get from that breed in the matter of 30 years a strain which can equal in performance breeds such as the Finnish Landrace or the East Friesian, a miracle should occur. This miracle occurred on a private property called Booroola in New South Wales in the early 1940s. The owners of the property, the late Seears brothers noticed that they get more twins than all their neighbors and even a few sets of triplets and quadruplets, something almost unheard of with the Merino. They realized that something different from the ordinary existed in their flock and started to capitalize on that. They selected their replacement ewes from those born as twins or triplets and used the best rams they could find in a local stud with no attention being paid to whether the ram was born as a twin or a single. The results obtained from this simple selection program was phenomenal. In 1959, after 15 years of serious selection the Seears brothers offered the Australian Government a ram born in a set of five and sold them 13 ewes born either as triplets or quadruplets. A year after another quintuplet ram and sextuplet ewe were donated. From this modest start, the herd at the CSIRO continued to grow and further selection



M.H. FAHMY
Research Station
Agriculture Canada,
Lennoxville, Que.

mystery is why there were so many ewes with triplets and quads in the Seears flock in the first place where in most Merino flocks high-order multiple births are rare? Dr. D.E. Robertson, a geneticist with Muresk Agricultural College in Western Australia, the only person in the world today to possess a commercial flock of Booroola Merino, presents an interesting hypothesis. He believes the fecundity of the Booroola may be caused by the mutation of a single gene which became dominant or partly dominant in view of the evidence available thus far. This evidence as reported by Dr. Robertson is as follows:

1. The Seears brothers who first developed the Booroola did so by selecting triplet-, quadruplet-, and quintuplet-bearing ewes from an ordinary flock with no previous selec-

tion for litter size. When mated with unselected rams these ewes gave daughters which also had large litters. This result is unique. Many scientists and breeders have tried selection for litter size in Merinos and achieved nothing more than a very slow increase in the incidence of twins.

2. No other merino strains or individual sheep have been found that will repeatedly have large litters as do many Booroola ewes. If several additive genes were involved a continuous range of lambing levels between the ordinary merino and the Booroola might be expected. These have not been found. The Booroola's habit of bearing litters sets it distinctly apart from other Merinos.
3. The average lambing performance of Booroola cross ewes has in one instance equalled that of pure Booroolas and many individual Booroola cross ewes have lifetime lambing records similar to typical Booroola ewes.
4. Three-quarter Booroola ewes appear indistinguishable from pure Booroola ewes in reproductive traits, ewe hoggets were found shedding five and six ova.
5. Some quarter Booroola II ewes have been found to be as fecund as half Booroola II ewes.
6. Individual Booroola ewes still fail to produce any multiple births despite the intense selection for litter size which has been applied for almost thirty years by CSIRO workers. This could mean that a favoured dominant gene for multiple births has not been fixed in the population. Persistence of the recessive gene would be expected despite intense selection, especially where males can only be ranked on the records of their dams and grandams.

An effective way of testing the hypothesis that a single dominant gene causes the Booroola fecundity would be to mate quarter Booroola rams with ordinary ewes and compare the fecun-



other farm animals. A few years ago an Ayrshire breeder advised us at Lennoxville that one of his cows was consistently calving twins and triplets, but unfortunately no action was taken to investigate the matter any further.

The important question which is undoubtedly being asked by all sheep breeders is whatever the reason for the fecundity factor in the Booroola, is it possible to transfer it to other strains by crossbreeding then backcrossing?

The principal impediment to such a process according to Dr. Robertson is the lack of a means of identifying rams carrying the fecundity factor. At present these rams must be progeny tested. However, other methods may be proved soon. An Australian scientist has evidence that testicular volume near puberty may have a quite strong genetic association with fecundity in part Booroola sheep. The measurement of testicular volume may not be precise enough to identify individual "carrier" rams. The measurement of hormone peaks may be more precise though less easy to use on farms.

In Australia the Booroola Merino was crossed with the unselected Merino to determine whether ewe progeny from the mating would have more lambs than ordinary Merino ewes. The number of lambs born per ewe lambing in 3-year-old ewes was 1.65 for the Booroola, 1.48 for the cross and 1.03 for the ordinary Merino. Studying the ovulation of the 3 groups by the technique of laparoscopy revealed that mean ovulation rates per ewe mated were 1.95, 1.81 and 1.06 respectively. In another study comparing Booroola cross to normal Merino control, the average number of lambs born/ewe mated was 1.62 compared to 0.91.

Can the Booroola Merino play a role in the Canadian sheep industry? The answer is yes. Taking into consideration the positive characteristics of the Merino in general i.e. superior wool yield, out of season breeding flocking instinct and adding to it high prolificacy the result would be an interesting breed for crossing range sheep. On the other hand the Merino is well known for its low fertility and late maturing which should also be taken into consideration.

Importation of this breed from Western Australia is easy because the only herd from which animals are available for exportation exists outside the blue tongue area and the Booroola is not subject to the Merino embargo imposed by the Australian Government.

For those who are interested in the Booroola Merino and wish to have more information, they can contact Dr. D.E. Robertson at Muresk Agricultural College, Muresk 6401, Western Australia.

