

## Treatment of Range Ewes with Estradiol Cyclopentylpropionate to Control Breeding—A Field Trial

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MOST OF THE sheep raisers in our area of West Texas follow the practice of having their range ewes lamb during a 45-day period beginning sometime in February or March. Very little lambing occurs after mid-April because screw worm flies are almost certain to have appeared by that time and because the growth of baby lambs is endangered by the approach of dry summer pastures. Considering the gestation period then, most of the local ranchmen turn rams in with the ewe flocks in mid-September and remove them before or

in mid-June for a 45-day period, and under this type of program a 50 to 60 per cent lamb crop is considered excellent. The early summer breeding is possible because Rambouillets are by far the predominating breed in the area, and it is an accepted fact that they can be bred at any time of the year, although with greater success in the autumn months. Furthermore, the climate affords such a favorable environment that seasonal impairment of libido and ovine semen quality has not been shown to occur here.



Fig. 1—This photograph shows a portion of the sheep used in the trial. Note paint brands and the marked rumps of a few of the ewes.

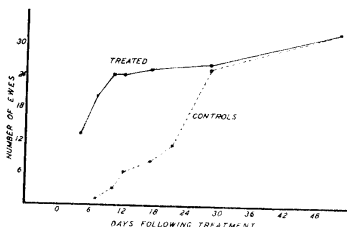
during the first week of November. Three to 4 rams are used per 100 ewes and, under such a program, lamb crops of 60 to 90 per cent may be expected.

A minority of the breeders raise winter lambs in order to take advantage of the higher prices offered for "off-season" lambs. Rams are turned into the ewe flocks

Since readers in the eastern states may wonder about the low lamb-crop percentages quoted above, it seems appropriate to explain that range conditions are far different from those encountered by farm flock sheep. Limited rainfall is often such that southwestern ranges do not produce sufficient forage for optimum breeding conditions. For the same reason, West Texas ranchmen do not select breeding ewes with the twin-

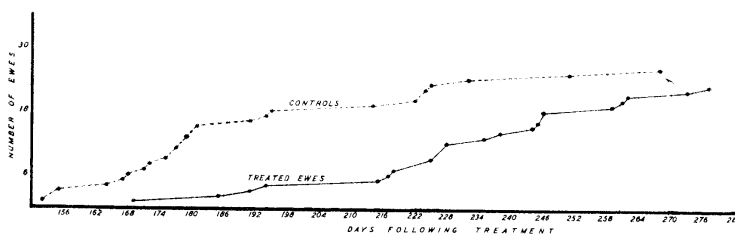
From Substation No. 14, Texas Agricultural Experiment Station, Sonora, Texas.

ning characteristic in mind for, more often than not, the condition of the range will not permit a ewe to rear 2 lambs satisfactorily.



Graph 1—Indication of breeding activity following treatment of ewes with estradiol cyclopentylpropionate.

Our breeders have long wished for a medicinal product which would make possible the production of controlled, uniform lambing or even two lamb crops a year; and those who raise winter lambs have the additional interest in increasing the percentage of the lamb crop. Little wonder, then, that the appearance in early 1952 of estradiol cyclopentylpropionate engendered a new wave of requests from ranchmen for information concerning its efficacy in controlled breeding. Many breeders, not caring to wait for completion of experimental trials, injected ewes with this drug with little regard for the risks or the expense involved. We have first-hand knowledge of several thousand ewes having been treated with this hormone. Generally, the numbers of lambs obtained were disappointing, but since controls had not been used in any case



Graph 2—Rate of lambing following treatment of ewes with estradiol cyclopentylpropionate.

which came to our attention, it was impossible to make much use of the data.

A field trial of the drug under consideration was indicated both for the purpose of helping to formulate an intelligent reply to the inquiries directed to the experiment station and for the purpose of establishing a basis for further investigation should the results indicate the need therefor. The trial described in this paper was begun at a time which coincided with the customary summer breeding season.

#### EXPERIMENTAL METHODS

The ewes used in this field trial were 64 purebred Rambouillets ranging in age from 2 to 7 years. They were grazing a 400-acre pasture composed of turf grasses, bunch grasses, and brush, and were receiving no supplemental feed. The 4 rams used were registered 2- to 3-year-old Rambouillets. At the beginning of the trial, on June 16, all of the sheep were in excellent condition. The weather was favorable for sheep breeding, being only comfortably warm during the day and cool at night.

The ewes were divided into two equal groups by random selection and were paint-branded numerically. The ewes in one group were treated with 1 mg. of the drug<sup>1</sup> given intramuscularly; the other group was untreated and constituted the controls. All ewes were pastured together for the duration of the trial.

The rams were turned into the pasture simultaneously with the ewes and remained with them for 150 consecutive days. Their briskets were painted with a nondrying coloring material which would mark the rumps of any ewes served. The briskets were repainted as often as necessary.

At the beginning of the trial, all sheep in the pasture were gathered at frequent intervals and the brand number recorded for each ewe which

<sup>1</sup>Supplied through courtesy of the Upjohn Company, Kalamazoo, Mich.

appeared to have been served. This required fifty-two days, at which time all ewes had apparently been served at least once. When lambing began, the flock was observed daily and the brand numbers were again recorded for each ewe which had lambed.

In order to conform as nearly as practicable to local husbandry practices, the sheep used in this trial were given no supplemental feed before the breeding period. ("Flushing" of ewes is almost never practiced here and is considered economically questionable.) By mid-January, however, lactating ewes and baby lambs were showing the effects of an inadequate winter pasture, and from that time until March 25 they were given, daily, some legume hay and  $\frac{1}{2}$  lb. of range cubes containing 20 per cent protein.

#### RESULTS

Graph 1 shows in detail the rate at which the two groups of ewes accepted the service of the rams, while graph 2 represents the lambing data. There was no apparent deviation from normal in the sex ratio of lambs in either group.

#### DISCUSSION

With respect to the breeding activity early in the trial, it is interesting to note that within ten days following treatment, indications were that 75 per cent of the treated ewes had accepted service, as compared with 9.4 per cent of the controls. By the thirtieth day, the two groups were practically equal and by the fifty-second day, all ewes in the trial appeared to have been served. Admittedly, this type of data may not be an entirely accurate indication of breeding activity but is interesting when viewed in the light of lambing data, which provide the true criterion of the efficacy of the drug used.

The most interesting and significant aspect of the lambing data can be realized by visualizing the results in a hypothetical manner; e.g., if the rams had been removed after a 45-day breeding period (which is customary in our locality), then the lines in graph 2 hardly could have extended beyond 200 days, at which time the treated ewes had produced a 12.5 per cent lamb crop compared with 56.25 per cent for the controls. Thus, the controls had produced a normal lamb crop for that time of the year.

It was fortunate that the trial was not conducted on the basis of a 45-day breeding period, for the question as to whether any permanent deleterious effects had occurred

in the treated ewes deserved an answer. Referring again to graph 2, the reader will see that although conception in the treated ewes was delayed, their lamb crop compared favorably with that of the controls at the end of the trial; it was presumed, therefore, that no permanent impairment of fertility occurred.

The methods used did not provide for determining whether ovulation occurred as a result of the nonproductive estrous periods in the treated ewes, nor was any attempt made to determine how many estrous periods occurred between the time of treatment and conception. This information would be of much academic interest but was not essential to the purpose of the trial.

In all fairness to the drug under consideration, readers are reminded that the results reported here do not detract from any value it may have as a therapeutic agent. Neither can they be considered as applying to those breeds of sheep having a more pronounced, seasonal anestrus period, without further experimentation.

#### SUMMARY

A field trial is described wherein Rambouillet range ewes were treated with estradiol cyclopentylpropionate and allowed to breed at pasture for a 150-day period, along with an equal number of controls. Results are shown graphically.

There were indications of induced breeding activity in the treated ewes shortly after treatment; however, the lambing data for the treated ewes did not compare favorably with the data for controls. Had the breeding period been terminated at the end of forty-five days, in accordance with local custom, the treated ewes would have produced a 12.5 per cent lamb crop as compared with 56.25 per cent for the controls.

#### CONCLUSIONS

The intramuscular injection of 1 mg. of estradiol cyclopentylpropionate did not produce a satisfactory degree of controlled breeding in Rambouillet range ewes under the conditions of the field trial described.

A tight bandage should not be placed on a dog's eye while anesthetized, unless a tube is placed in the trachea. Otherwise, the animal may be strangulated.—W. G. Magrane, D.V.M., Mishawaka, Ind.

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