

ROLE OF SHEEP HUSBANDRY IN DRY FARMING

by G. C. TANEJA*, *Head, Division of Animal Studies, Central Arid Zone Research Institute, Jodhpur*

Sheep raising is a major occupation in the drier areas where the crops production is either uncertain or difficult. Droughts are frequent in the desert and when the crops fail, farmers can still count on the income from the sale of wool and surplus stock and, therefore, sheep raising contributes substantial amount to the income of the farmers in these areas.

Sheep raising has been wedged into the agriculture mostly by grazing the animals on stubbles. There is a need to reorient our thinking on sheep raising in these areas where the recent techniques of water harvesting, soil conservation, mixed cropping, strip cropping etc., are being applied to raise productivity from the land. The paper deals with the recent advances in dry farming techniques in the arid areas in relation to sheep production.

It is suggested that a coordination between the researchers in 3 main fields—Agricultural, Forestry and Animal Husbandry—is required to supplement each other so that the farmers in the arid areas receive maximum returns. A proper balance amongst these 3 disciplines is more important in the drier areas than in other regions in the country.

In the chronically water deficient areas of Rajasthan the current farming practice involves production of *bajra* for human consumption and of *guar* for feeding the livestock. This man-plant-animal relationship has been in existence since time immemorial. Our present knowledge on agriculture should be aimed at raising this relationship from the present subsistence level to a higher plane to improve the standard of living of the Man in the desert. This requires manipulation of all the three factors. The recent advances in the field of dry farming are going to alter the cropping pattern and a variety of newer crops are likely to be introduced. It is generally observed that while the strategy is for increasing the overall living standard of the farmer, the emphasis, by and large, turns out to be on increasing the agricultural produce per unit area or on introducing crops that have better economic returns. The development of resources for feeding of livestock is either neglected or it is assumed that this factor will take care of itself, with changes in the agricultural pattern. An attempt is made in this note to present the role of animal husbandry, particularly sheep production, with changes in the development of drier zones with the application of advanced knowledge in the field of dry farming.

(a) *Sheep raising—a major occupation*

The sheep and wool industry has always flourished in the dry areas as agriculture in these regions is either uncertain or difficult. Sheep raising has been wedged into agriculture, mostly by grazing the animals on the stubbles. Droughts are frequent in

**Present address*: Joint Commissioner (Sheep & Goat), Ministry of Agriculture, Krishi Bhavan New Delhi 110 001.

the desert and when the crops fail, farmer can still count on the income from the sale of wool and surplus stock and, therefore, sheep raising contributes substantially to the income of the farmers in these areas. About 40% of the rural population in the desert depends directly on animal husbandry particularly sheep raising and an equally large proportion depends on this indirectly. Improvement in this field, therefore, will bring a more rapid advancement in the rural sector.

(b) *Judicious use of surplus grass-hay making*

The dry western area of India sustains the largest portion of the sheep population of India. Out of 40 million sheep in the whole country, 13 million are exclusively in this area. Except for isolated pockets in these areas where two crops may be raised (with rabi crops watered from saline wells) generally only one crop in the rainy season is mainly raised. The crop period extends from July to September and during this period sheep are grazed on the common grazing lands where there is no dearth of grass and often it is in excess of the actual requirements as grass grows faster than it can be consumed by grazing animals and in most of the areas it is trampled. There are no adequate means of conserving the excess grass. The farmer is occupied with his agricultural operations during the rainy season and his lack of knowledge of conserving fodder and grass is the main problem in this direction. Here is one area where action is necessary. Surplus grass during this period can be harvested before flowering sets in. Either hay or silage can be made. Government agencies can come to the rescue of the farmer in forming fodder banks so that the reserve stock can be used during the dry period.

(c) *Stubble grazing*

As soon as the crops are harvested sheep are let out to be grazed on the stubbles. There is a great need to regulate this grazing. Often sheep are allowed to graze to the last remnants of the stubble. The grazing should be regulated, so that not only it can continue for a longer period but also to ensure that the roots of the grasses are not pulled out. Otherwise, such total utilisation is going to cause further erosion of soil. In most of the areas where the holdings are small, the farmers pluck the earheads as and when they mature and the fodder is not harvested. As soon as the last earhead is cut sheep are let out in the fields to feed on the standing stalk. In other cases the harvesting is done at different heights of the plants. It still remains to be determined what should be the length of the stubble that may be enough to assist in the process of soil and moisture conservation and at the same time to provide enough stubbles for grazing. Scientists have, no doubt, worked out the optimum height at which the crop should be cut for stubble mulching in order to prevent wind erosion but while doing so they have not considered the needs of the animals that conventionally live on the stubbles. Stubble grazing, has however, come to stay as the main source of feeding sheep in the dry farming areas.

(d) *Reserve pasture*

In most of the areas there are no reserve pastures and that is the main setback to the sheep industry which has suffered considerably on this account. The Government

and the local bodies can acquire the common grazing lands and develop them into reserve pastures at vulnerable points in the principal sheep zones. These pastures may be properly reseeded with improved grass species fenced and divided into small units and adequately provided with water reserves, veterinary aid, artificial insemination service, facilities for shearing and marketing of wool, etc. These pastures may be allotted for grazing to the local graziers during the drier periods of the year and for the rest of the year, these may be conserved and maintained. A nominal fee per animal may be charged from the graziers for providing the pasture and for supplying other husbandry and veterinary facilities as mentioned above. This will further induce the sheep farmer to use these reserve pastures.

(e) *Competition of grass with crops*

Although it is inconceivable that in the drier areas sheep may completely displace crop farming yet it is likely that an emphasis on sheep farming as a subsidiary occupation may change with the use of newer techniques for water harvesting and adequate utilisation of fertilisers in the desert areas to augment agricultural production. Where higher yields can be obtained from crops with improved technology, return from sheep farming will either tend to diminish or increase depending upon whether with these newer techniques more grasses and fodder can become available. If the yield from agriculture increases as the result of bringing more grassland under crop cultivation, sheep raising may have a serious setback in spite of the extra fodder being made available. However, the changes in the ratio of grass to fodder will eventually determine this factor.

(f) *Cross bred sheep and higher fodder yielding crops*

A solution to these problems can be found by growing crops which yield more fodder (and of course more grains) and by introducing cross bred sheep which yield more wool of a better quality. The present philosophy of augmenting agricultural produce, no doubt, sounds very good but in the areas where the economy of the farmer depends on mixed farming as in the drier zone, the importance of raising crops with a high fodder yield cannot be underestimated. Therefore, we have to look for such varieties of crops for dry farming zones which yield a fairly higher proportion of fodder. At the same time low yielding indigenous sheep must be replaced by higher yielding cross bred stock. That is, the production of wool per animal must rise. Reduction in sheep number and increase in total yield must be the aim of the sheep industry in the drier areas.

(g) *Replacement of crops—a setback to sheep industry*

The rainy season is limited only to 3 months in a year and it seems impossible that during this short period the farmer may be able to get two crops no matter what technology on water harvesting and what combination of crops with minimum maturing periods are used. Therefore, the only course for increasing yield will be to bring more area under cultivation of one crop and apply better technology of water harvesting and use improved seeds, plenty of fertilisers, etc. The other important consideration for economic crop production in these moisture deficient areas may be the replacement of

traditional crops like *bajra* with others with assured higher net economic returns per unit of land such as sunflower, castor, etc. However, this change-over, if widely practised, will seriously affect sheep production as the stubbles of these crops will not support sheep during the dry periods as these have hollow stems and are highly fibrous and hard and are, therefore, not relished by sheep. The observations made at C.A.Z.R.I. corroborate this statement.

(h) *Catchment areas—grass production*

The optimum use of catchment areas in the drier zones may change the cropping pattern and also affect sheep production. In large water sheds, the limits up to which water recedes till October, rabi crops are sown to make use of the available moisture. Is there any possibility of bringing some land in the catchment area under grass? Grasses are to be sown across the water flow in the catchment area to restrict soil erosion. Regulated grazing on these grasses may serve a dual purpose viz., checking soil erosion and increasing animal production. Growing of grasses in the catchment, on the other hand, may affect the moisture status of the catchment area considerably and subsequently the catchment may not serve the purpose for which it is meant or at least adversely affect the purpose.

(i) *Strip Cropping*

Strip cropping with grass holds a great promise of increasing productivity from livestock in the desert areas. In this system strips of grasses are grown alternating with those of crops. The experiments at C.A.Z.R.I. have shown that the grass to crop ratio of 1:6 is highly economical in strip cropping. The grass strip protects the soil from wind erosion and in the event of failure of crop for want of adequate rainfall, the farmer can still make use of the grass for raising animals. In certain areas grasses can be used as rotational crop with profit. In England ley farming has been practised on cultivated areas with considerable advantage. Under this system, the grasses are grown for a number of years (say 10–15 years) for the improvement of soil structure owing to the binding action of the roots and complete absence of tillage. Thereafter, the ley is removed by tillage and the crops are grown till the recovered soil can sustain the crop production. Grasses and legumes raise the fertility of soil. Legumes help in nitrogen fixation whereas roots of grasses decompose and enrich the soil with organic matter. During the period when sheep are grazed in the ley there is an additional advantage to the soil in obtaining organic manure from dung and urine.

(j) *Goat raising*

At present there are more goats than sheep in the desert and development in this direction is as vital as for sheep. Goat can be developed either for mutton or for milk or mohair. Development for mutton and milk is more promising in the drier areas. If goat is for mutton, then the aim should be to achieve early maturity and faster growth, and if it is for milk, the objective should be to get more milk per unit of concentrates consumed when compared with dairy cattle, so that it can act as a poor man's cow in

the desert. The goat's milk can serve the needs of the farming community for protein and also a valuable infant feed. Developing dairy goats in the assured rainfall areas or in the irrigated areas which are suited for dairy cattle will create a competition among these beasts for the available feed, whereas in the desert maintenance of dairy cows is definitely a difficult proposition except around the large cities. Foresters would conceivably have objection to keeping goats, but the intensive housing and feeding on agricultural residues with high rate of reproduction in this species, unlike that in indigenous sheep would, solve the problem.

(k) *Fodder trees*

Growing of fodder trees in the arid areas has received practically no attention. Its importance, however, from the animal production point of view cannot be underestimated. It is a common practice that during the lean months sheep are fed largely on the lopping from the fodder trees, and the loppings from some of the fodder trees are not only palatable but highly nutritious also. Forestry and soil conservation experts consider quick and fast growing tree species as an important factor in checking soil erosion and the result has been that in arid and drier areas fast growing trees like Eucalyptus have been planted and the fodder trees have been given no attention. The purpose of checking soil erosion is no doubt served by planting fast growing trees but the same purpose can possibly be achieved by growing rows of fast growing species alternating with rows of fodder trees. This will serve a dual purpose—except for a few cases the fodder trees are generally slow growing, and therefore, they do not attract the attention of foresters. An ideal farm in the drier areas would be the one which has the fodder trees all around its periphery to act as a shelter belt and provide fodder to livestock in lean months. In the pasture land growing of more and more of fodder trees will largely solve the problem of feeding the stock during the drought.

In conclusion, the researches in agriculture are advancing in increasing yields per unit of land on the desert area, and forestry and soil experts are working for checking soil erosion but adequate attention is not being given to the animal which is one of the true consumers—the other being man himself—a coordination between the researchers in the three main fields—agriculture, forestry and animal husbandry is required to supplement each—so that the farmer receives maximum return per unit of land. Overemphasis in any one of these disciplines will be at the expense of the others, resulting in proportional reduction in the net return to Man on the land, a proper balance amongst these three disciplines is more important in the drier areas than in any other region in the country.