

DEVELOPING INBRED LINES OF POULTRY

By Reece L. Bryant
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In a project comparing the economic traits of hybrids and outbred chickens, it was necessary for this station to develop its own inbred lines.

Beginning in the spring of 1949 5 pens of the North Dakota Experiment Station strain of White Plymouth Rocks and 2 pens of New Hampshires, each headed by a single male, were used to start the development of the lines. Because of the poor performance of one of the White Plymouth Rock matings and the New Hampshires, these were dropped at the end of the first year. In 1950 three matings of Kansas State College strain of White Plymouth Rocks were added and in 1951 each line was sub-divided so that there were 14 pens of White Plymouth Rocks.

For the first four generations, the matings were brother x sister. After that, and to the present time, no matings have been more distant than brother x half-sister. Consequently, the coefficient of inbreeding increased at a very rapid rate at first and more slowly later but always increasing with each succeeding generation.

Among laymen there appears to be as many beliefs about inbreeding and its effects as there are persons who express an opinion. That is due probably because inbreeding increases homozygosity or purity. Therefore, the unwanted as

well as the wanted inherited characters are intensified. Without very close selection, it is impossible to predict the performance of several inbred lines originating from a common heterozygous flock. For example, in the developing of the inbred lines reported here, egg size *per se* was not stressed in selecting for the breeders of the next generation. Some of the lines developed from the same common stock produce eggs that average less than 50 grams each while other lines produce eggs that average approximately 65 grams.

No selection was made on body characteristics if they apparently had no effect on economic value. Therefore, the several inbred lines vary greatly in appearance. One line has developed large combs and wattles such as are seen on Leghorns or Minorcas. Two lines have very crooked toes and one has so many side sprigs on the combs that the combs somewhat resemble the rose comb in appearance. One line that was developed from the Kansas strain began to produce chicks, some of which were black and some barred. These off-colored chicks were never placed in the breeding pens so that trait ceased to be a problem. None of the body characteristics mentioned seems to have affected the breeding worth of the lines.

Other workers have reported that inbreeding has an adverse effect on fertility and on the hatch of fertile eggs. This station experienced these same effects. Four of the original 14 lines have been lost because they were unable to reproduce themselves. The remaining lines seem to have leveled off at a hatch of approximately 45 percent of total eggs set. Egg production dropped from approximately 60 percent on a hen-day basis to approximately 40 percent. Viabil-

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ity, as expressed by mortality, decreased in the inbreds both as young stock and in the laying pens.

Except for egg size in some lines, inbreeding has resulted in a decrease of most economic characteristics as compared with the outbred White Plymouth Rocks from which they were derived. It must be borne in mind that the value of the inbred chicken is not in the perform-

ance of the lines themselves but in how well they combine with other lines of inbreds or with outbreds. Further reports will give that information. This report is given to demonstrate the problems arising in producing inbred lines and some of the characteristics of the birds that resulted from continuous inbreeding.

Dr. Robert E. Moreng, formerly of this station and now at Colorado State University, assisted in a portion of the work on this project.

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It's Hard To Beat!!

Sorghum for Forage

By J. F. Carter

Sorghum in North Dakota is a valuable silage or fodder crop when seeded about June 1, or about 2 weeks after corn planting time. Because it can produce a crop when planted as late as July 1, it has value as an emergency crop in years when flooded soil, late weed control, loss of a seeded crop, unusually dry soil, or any other reason makes very late seeding necessary. Sorghum also can be depended on to produce needed forage in times of feed shortage.

Forage sorghum, sometimes locally called "sugar cane", "cane" or "sorgo", is grown in the Great Plains area from Texas to North Dakota. The plant has a large, tall corn-like stem with conspicuous nodes or "joints", bearing broad leaves 2 to 3 feet long. A large panicle or "head" producing several hundred seeds

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is borne at the top of a 4 to 9 foot stalk. The stem is often very juicy, and sweet as it contains soluble sugars. The leaves and stems are palatable to livestock.

The root system is fibrous and extensive. The plant uses water efficiently in producing plant material. Sorghum is drouth resistant and can survive drouth periods in a somewhat dormant condition and resume growth later without great plant damage as occurs with corn or many other plants. Sorghum is a heat-loving plant and grows best in a warm, fertile soil with a good moisture supply. Seeding should be delayed until the soil and air temperatures are warmer than those for corn. The plant is killed by the first severe frost in the fall, but the leaves appear to dry more slowly and shatter less easily after frost than corn. Cold night temperatures probably con-