Improving Fertility Of Turkey Eggs[1]

1. Rotation of Toms in the Flock

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Fertility of turkey eggs is of prime importance to the flock owner as well as to the hatchery operator. Efficient production of turkey poults is important, since it increases the profits for the seller and reduces the cost to the purchaser. High fertility is usually related to high hatchability of the eggs, all other conditions being equal, and is accompanied by good livability of the poults. It takes very few extra poults to pay for extra efforts and produce the difference between profit and loss.

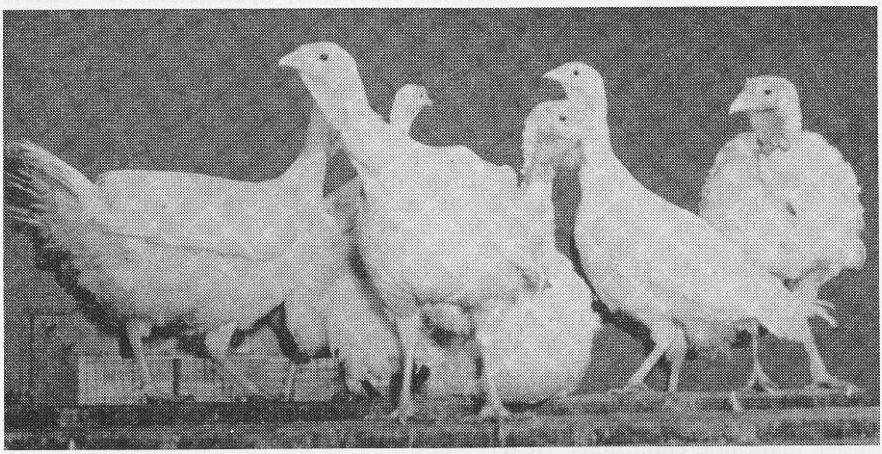

FIGURE 1.—*Rotation of toms in this healthy breeding flock was instrumental in improving fertility of the hatching eggs produced.*

Problems of fertility in the turkey breeder flock frequently arise even though the birds may be healthy and well managed. The development of new and heavy breeds of turkeys with emphasis on breast development in the "beef type" turkeys has made artificial insemination a profitable boost to most flocks. There are, however, certain labor and management problems involved in artificial methods which have not been thoroughly solved and which may be overcome partially or completely by other methods of mating with comparable results. The time to consider hatchability and fertility of the turkey flock should be prior to the

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breeding season so that systems and methods can be thoroughly thought out in advance of the actual mating of the flock.

Mating problems have been studied over the past three years at this station, since interests in fertility mentioned above are of prime importance to flock owners throughout the state. The problems of fertility have also been important in the experiment station breeding program. In examining data on fertility it was obvious that certain hens never laid a fertile egg or that only occasionally would they produce average fertility. It was also noted that certain hens produced fertile eggs for a period and then produced infertile eggs for a certain period. A great portion of this lack of fertility or the varied fertility may be attributed to preferential mating between toms and certain hens, thus leaving other high producing hens without mating.

Since the rotation of toms on a somewhat different basis had been found to be a successful practice by a local flock owner it was decided to try out the plan at the experiment station turkey unit.

TABLE I.—**Effects of rotating toms between breeding pens on the fertility of turkey eggs. Season 1954.**

	Hatch Number						
	Before rotating toms			After rotating toms			
Pen 1	1	2	3	4	5	6	7
Per cent fertility	24.2	30.0	43.2	61.5	61.1	44.3	25.4
Per cent fertile eggs hatched	85.5	54.5	59.4	72.9	70.7	57.1	66.7
Pen 2							
Per cent fertility	31.0	43.0	46.1	67.9	73.7	57.1	72.5
Per cent fertile eggs hatched	94.4	51.2	73.2	80.7	64.3	75.0	56.0
Pen 3							
Per cent fertility	90.9	78.0	67.4	79.7	83.8	75.3	83.3
Per cent fertile eggs hatched	64.0	46.2	56.5	73.0	73.1	76.1	72.3

A modified plan was put into effect in the 1954 hatching season. This was used with three breeding pens containing approximately 15 hens and two toms each. All the toms were removed and placed in one stud pen together, then one tom was assigned to each pen at random and allowed to remain for two days. After this period the toms were returned to the stud pens from the breeding pens and the toms which had been at rest in the stud pens were distributed at random to the breeding pens. This procedure was repeated every third day. The toms were always rotated at random, with as much care as possible being exercised to eliminate the same tom from being placed in the same pen twice in successive rotation. Eggs were collected for a two week period prior to incubation. They were stored at 45° F. and then incubated in a forced draft incubator at 99.5° F.

TABLE II.—**Per cent fertility of turkey eggs when toms were assigned to one breeding pen for the season. Season 1953.**

Pen 1	Hatch Number 1	2	3
Per cent fertility	70.6	68.2	60.0
Per cent fertile eggs hatched	80.6	62.2	66.7
Pen 2			
Per cent fertility	75.3	78.1	81.5
Per cent fertile eggs hatched	78.7	76.5	71.7

During the 1954 season this rotation plan was initiated after eggs had been collected, using the regular pen method of matings for three hatches. Table I contains the data compiled from the pen records before and after rotation of the toms. It can be seen from this table that when the toms were rotated fertility increased markedly over that of the first three hatches. This is most noticeable in Pens 1 and 2 where fertility prior to this time was very poor. The least amount of change was noted in Pen 3, although a measurable increase in fertility may be noted here also. Table II contains the data gathered on fertility for pens one and two, during the 1953 breeding season when the pen method of mating was used exclusively. Although fertility was not as poor as in the 1954 season, it presents a basis for further comparison of the two methods of mating. In comparing the 1953 and 1954 data on pen matings with the data presented for 1955 in Table III, one can note a marked improvement in the per cent of fertile eggs when the toms were rotated, which was twice a week during the 1955 season.

TABLE III.—**Fertility of turkey eggs when toms were rotated twice per week. Season 1955.**

Pen 1	Hatch Number 1	2	3	4
Per cent fertility	80.0	70.9	74.2	88.4
Per cent fertile eggs hatched	81.6	80.0	60.6	59.4
Pen 2				
Per cent fertility	83.5	66.1	60.3	68.1
Per cent fertile eggs hatched	72.9	60.5	50.0	49.4
Pen 3				
Per cent fertility	69.9	72.8	83.0	88.4
Per cent fertile eggs hatched	69.0	79.1	47.0	64.2

No definite pattern of change was noted in the percentage of fertile eggs which hatched although there was some expected variation from year to year. It will be noted that the percentage of fertile eggs which hatched was high even though fertility of the total number of eggs was poor. Incubation and other factors play a prime importance in hatchability, which for the most part are not concerned with data on fertility in this study.

Although this method has been described for small breeding pens it is felt that it could be easily and successfully adapted to

the large breeder flock. Rotating toms every five to seven days in the large flock should be successful and at the same time hold labor to a minimum.

Summary

A method of rotating toms in a turkey flock so that only half the toms are in the pen at one time has been described. This eliminates to a large extent the preference shown by certain toms and hens to mate and consequently increases the fertility of the eggs with a minimum of labor on the part of the flock owner.

RECORD HONEY CROP IN 1954

Beekeepers in North Dakota produced 2,100,000 pounds of honey in 1954 according to the USDA Agricultural Marketing Service. Production of honey per colony was 140 pounds, the highest in the nation and equal to the 1953 record yield for North Dakota. The 1954 honey crop is the largest since 1946. Number of colonies was placed at 15,000, the most since 1949.

Average price received for honey sold was 13.4 cents per pound, wholesale and retail combined. Value of the honey crop was placed at $281,000 and value of the beeswax was $18,000. Stocks of honey still on hand and for sale at the end of 1954 were 252,000 pounds compared with 273,000 pounds at the close of 1953.

For the United States, honey production in 1954 totaled 217,414,000 pounds, three per cent less than in 1953 and the smallest crop since 1948. Production per colony was 39.8 pounds. The 1954 crop was produced by 5,467,000 colonies of bees. Because of the widespread drought, honey yields per colony in 1954 were the lowest since 1948. Yields were down in all regions of the country except the West and South Atlantic.

Beekeepers received an average price of 17 cents per pound for all honey sold in 1954, including the combined wholesale and retail sales of extracted, chunk and comb honey, about three per cent higher than for 1953.

FARM POPULATION ON DECREASE

The farm population is still going down. A recent survey by the Census Bureau shows there are now less than 22 million people living on American farms. Half a dozen years ago there were over 25 million.

The farm population is dropping while the total population of the country is still going up.

In 1950 the farm population made up 16 per cent of the total population. Today, only 13 and one-half per cent of all the people in the United States live on farms.

Date	Total population (in thousands)	Farm population (in thousands)	Farm population as a % of the total	Index of Farm Output (1935-39=100)	% of Increase
1910	91,855	32,077	35	79	...
1920	106,089	31,556	30	92	16
1930	122,775	29,447	24	95	3
1940	131,820	29,047	22	110	16
1950	151,132	24,335	16	136	24