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Fowl Pox Immunity.—Immunity against fowl pox has been tried successfully for many years but was used only on adult fowls or birds half-grown until very recently. The Poultry Husbandry Department of Iowa State College has more recently experimented with the vaccine on day-old chicks with apparent success. Following their example we used it on 2000 baby chicks at our Farm at Katpadi and our results also were successful to a large extent. We did find that the chicks reacted to the treatment but the disease occurred in a rather mild form. The shock of the treatment did lower the vitality of the chicks so that I would not recommend it to a person who can control the disease successfully with the tonic and general thriftiness.

We made our own vaccine as follows:—One part powdered fowl pox scab secured from infected birds was mixed with 250 parts of a dilutent made of:

40 per cent. glycerine
60 ,, ,, 0·85 per cent. sterile saline solution. (We used a concentrated saturated saline solution).

A small patch of fluff is plucked from the breast of the chick and slightly scarified to obtain a successful infection and uniform reaction. The vaccine is applied to the skin and feather follicles with a stiff brush. The chicks should be isolated in a dark room for a day or two following the treatment to prevent cannibalism by picking at the wound. Here again success will depend in no small measure on the general health of the youngsters both before and after treatment.

I should like to say that our experiment has not been tried sufficiently long to enable us to make any dogmatic statements, but our limited experience does lead us to believe that this simple treatment may perhaps prove a real boon to the village poultry-raiser in India who can secure the service of an interested party to demonstrate the manner of treatment on a commercial basis perhaps.

Summary.–To summarise my brief remarks I should say:—try to raise your chicks in October, November and December, push them all you can the first two months at least, giving them the tonic from the 15th of January for several-month and as a last resort, fall back on the immunzation work to protect our feathered friends.

THE SANITARY DISPOSAL & AGRICULTURAL UTILISATION OF HABITATION WASTES BY THE INDORE PROCESS

By F. K. JACKSON & Y. D. WAD

Detailed Technique.

Installation.—The essential part is the charging trench, which should be fifteen feet wide, and two feet deep. The floor must slope gently along its length to prevent water-logging, and must discharge into a natural drainage channel. It must be served by a road to be used as a charging platform running alongside. This road may lie between two trenches, serving each, and usually the most economical construction is to dig the trenches one foot deep and pile enough of the excavated earth to make the road-foundation. The road should be at least fifteen feet wide (preferably twenty feet) and suitably metalled to stand carting in wet weather. The side of the trench against the road must be vertical and should be reveted with timber or a wall of stone or brick, the top of which should carry a sill of suitable material (e.g., old steel rails, girders, or heavy logs) against which carts can back. Without this sill a log must be put in position at each tipping:

The other side of the trench is to be bunded, preferably by a partition, the top half of which is removable—old sleepers, boards, logs, or thick corrugated iron sheet between upright posts—or by an earth, stone or brick wall, rising two feet above the trench floor. Beyond this partition about twenty feet space must be left for storage; in practice extensive sales of compost are usually confined to two or three periods of the year. This storage ground may be excavated level with the bottom of the trench if desired. Unless dug on solid stony ground the trench must always be floored with road metal or at least well-rammed brick-bats and rubble; the storage ground is also better so treated. It is wise to build an earth bank with a drain on those sides of the whole installation from which the flow of surface water is to be feared.

The total length of charging trench required is determined by the average daily quantity of refuse received. Experience has shown that for each cart-load (a cart-load of refuse is here taken as 35 cubic feet and a cart-load of night-soil as 60 gallons), of refuse received daily, 1 foot 4 inches length of trench is necessary. The volume of night-soil received has no influence on this figure as it is taken up in the interspaces.

Charging the trench.—The first charge should be made so as to leave a vacant space of four feet at one end of the trench. To start with, cart-loads of refuse, without sorting, are tipped in from the charging platform and spread by drag rakes to make a layer three or four inches thick. About a dozen forkfuls of inoculum from a charge at least two weeks old is then scattered (this of course is not necessary for the first charges of a new installation) and the cartful of night-soil tipped on the top, followed immediately by more refuse, tipped over the night-soil. Then the refuse, together with the night-soil below, is drawn by drag rakes in small lots until the breadth of the trench opposite is covered. About four layers per day should be made thus until the whole depth is charged in two days. The top layer for the day and at the end of the charge should be refuse only, without being mixed with the night-soil layers beneath. This top layer should not be more than 1 inch to 2 inches thick, being intended as a coating to preserve uniform moisture, and to prevent the breeding of fly larvae on top. The next charge should be given to the adjacent portion of the trench without any interspace and so on continuously

Proportion of night-soil to refuse.— No proportioning is necessary: whatever quantities of refuse or night-soil arrive must be treated at once, no excess of either being left over. If the proportion of night-soil is high or of a very liquid nature, the refuse layer should be spread with a surrounding raised margin until the mixing is complete. After the charge or the later turns the heaps must have flat tops and vertical sides, otherwise difficulty will arise in preventing water-logging in a wet season and in keeping uniform moisture during dry weather.

First turn.—Two days after charging is finished the first turn is given—i. e., four days from the start. Half the charge is forked on the four feet-vacant space left. Then the remainder of the charge, is forked on top of this already-turned mass.

While this is being done water should be distributed if necessary from a hose or by hand upon the turned material so as to soak it without permitting seepage or local water-logging. Sullage water may well be applied to the lower layers at this stage but on no account to the surface.

The few fly larvae that may be found on the cool sides of the charge are turned into the heap and destroyed by the high temperature therein. If the first turn is delayed beyond four days there will be a greater development of maggots

and more chance of their escaping to pupate in crevices in the walls or floor of the trench, especially in wet weather Such pupation is usually slight and if desired can easily be checked by disinfectants.

Second turn.—The second turn is given eight days later by forking the charge over to the opposite side of the trench, adding water if necessary.

Third turn.—This should be given from eight to fifteen days after the second turn according to the stage of decomposition—when the material has crumbled to a fairly advanced degree. The mass is forked out of the trench (with watering as necessary) on to the adjacent storage ground where it may be heaped up to four feet in height.

Watering between turns.—During very hot or windy weather the upper layers may become too dry ; a well-distributed surface watering should then be given.

Duration of the process. The manure will be ready for use in from three to eight weeks after charging, the period depending on the proportion of night-soil to refuse, the correct control of moisture and air throughout and the season.

Precautions during monsoon rains. The initial charge should not occupy the full width of the trench ; a two feet space should be left next to the partition to allow storm-water to flow. If there is risk of water flowing into the trenches from the road the charge should be built up a foot higher, above road level. In a trench of considerable length there may be a danger of exposed corners of the heap being washed away by drainage water on the trench floor. This can be prevented by protecting such surfaces with strips of sheet iron about three feet long and suitable height. During prolonged rains it is advisable to give the third turn earlier, to prevent water-logging and slowing down decomposition.

Implements necessary. One drag rake with four seven-inch blunt steel tines and a long handle, and one fork will be needed to deal with a daily intake of five cart-loads of refuse. English shovels are useful for handling the finer material.

The sprinkling of water to ensure good distribution may be done, on a small scale, by throwing it with a suitable vessel such as *tagari*. For larger installations a hand pump with a hose and sprayer or even a permanent supply of piped water would be more efficient. (From *Instt. of Plant. Industry*, Indore, Bull. No. 1. 1934.)

Research Notes.

The occurrence of a conjoint node at a constant position in indicum cottons.

The usual arrangement of the nodes and leaves on the stem of the cotton plant is a spiral one. In the course of counts leading to the determination of the first fruiting branch node in selections of indicum cotton both at Nandyal (in the 'Northerns' area) and at the Agricultural Research Station, Kovilpatti (in the Tinnevelly cotton area), the author has met with cases of plants where the positions of two of the nodes and consequently of the two leaves happened to be conjoint instead of being separate from one another like the rest of the nodes in the spiral phyllotaxy. An interesting feature about this occurrence is that the position of these conjoint nodes happens to be constant ; i. e., counting the node after the pair of seed leaves as the first, the position of the two conjoint nodes invariably happens to be the third and fourth. Stray cases of the seventh and eighth nodes occurring collaterally have also been noted by the author at Kovilpatti. The accompanying plate shows, side by side, a normal plant and one where the conjoint nodes occur at the third and fourth positions.