

The treatment is said to be effective with regard to the existing weevil population, in retarding oviposition and hence preventing reinfestation, and to be economically practicable from the point of view of cost and ease of application. (*Bulletin of the Imperial Institute*, Vol. XXXV No. 3. 1937.)

Agricultural Jottings.

By THE DEPARTMENT OF AGRICULTURE, MADRAS

The Preservation of Cattle Manure. Cattle manure is collected and stored by cultivators, generally in an unsatisfactory manner. There is loss of manurial ingredients occurring in the manure heaps made by them and such losses could be easily avoided. When the cattle dung, waste fodder and other farm waste available are properly stored in pits day after day, there is fermentation taking place in the materials leading to their disintegration and when well made, the resulting material is rich, black in colour, uniform and powdery in appearance. When the manure is heaped in the open, the decomposition of the constituent materials is incomplete and a fair part of the heap is dried up and is in lumps. There is considerable aeration inside the heap and volatile products of decomposition, which are rich in nitrogen are lost. During rains, the heaps are soaked with water and the soluble portions of the manure rich in nitrogen are washed away and the cultivator is again a loser.

The preservation of the cattle manure can be done easily without much trouble or increased expenditure. It has to be borne in mind however that both dung and urine of cattle contain valuable manurial ingredients and have to be collected without allowing any to be wasted. The losses in the making of the manure are minimised by collecting the manure in pits, preferably provided with impermeable sides and flooring, and a roofing to guard against rain and sun. The sides of the pit should be raised over the ground level, to prevent rain water from the surrounding areas getting into the pit. All available organic wastes can be added to the manure pit. The manure in the pit has to be levelled once a fortnight and covered with a thin layer of earth, preferably tank silt. These help to increase the bulk of the manure. The silt helps to fix the volatile gases resulting from the fermentation of the manure and prevents loss of valuable manurial ingredients.

There are a few systems of stalling the animals and collecting and preserving manure that are satisfactory. The cattle shed may be provided with an impermeable flooring to permit urine being collected and led to the manure pit by means of suitable drains. The sheds can be washed every day and the washings also led into the manure pit. This is called the 'Byre System'. The byre or the cattle shed can be kept clean and tidy and is therefore pre-eminently suitable for housing cows and calves in particular.

It is not necessary to have pucca flooring for all classes of cattle. The working animals can be stalled in what is known as a loose-box, which is a combination of a cattle shed and manure pit requiring very little attention. Pits are dug to a depth of $2\frac{1}{2}$ to 3 feet sufficiently large to house the animals and the entrance is made lightly sloping to permit the cattle to get in and get out easily. A feeding trough may be built on one side or a movable manger put in. The waste fodder and waste products of the farm like dried leaves, may be spread on the floor to absorb the urine voided by the animals and to provide them bedding. The dung dropped by the cattle may be spread evenly over the floor every morning and a layer of waste spread over it. The manure obtained from the loose box is very rich. Animals have been stalled in loose boxes in the various agricultural stations for the past 30 years and over and their health has not been affected.

The Loose-Earth System. This is a modification of the byre-system. The flooring is made with a layer of loose sand and silt, preferably in the proportion of 3:1, to a depth of 6 to 9 inches. The loose soil absorbs all the urine and the moistened soil is removed and added on to the manure in the pit and the moistened soil is renewed whenever necessary. This system should appeal to the cultivator in tracts where there is scarcity of fodder and waste matter in general and which could not therefore be used to absorb the urine and excess moisture in the dung.

A short note on the cultivation of Plums on the Nilgiris. Experience during the last 15 years has shown that Coonoor, Kotagiri and the surrounding villages are quite suitable for the cultivation of Japanese plums. A large number of varieties of plums have been under trial at the Pomological Station, Coonoor, and it has been found that the varieties 'Aloo-Bokhara', 'Hale', 'Rubio', 'Abundance', and 'Shairo' grow and crop very well.

'Aloo-Bokhara' is a cooking variety, but a very prolific bearer, producing 2,000—3,000 fruits per tree. 'Hale' is a good eating plum and an equally prolific bearer as the variety 'Aloo-Bhokara.' 'Rubio' also is a fairly good eating plum and a fairly good cropper, bearing 800—1,000 fruits per tree. This is the earliest variety of eating plums cultivated on the Nilgiris and this is good for jam making. The varieties 'Abundance' and 'Shiro' are very good desert plums, but produce only 150—200 fruits per tree.

Country peach is indigenous to the Nilgiris and its seedlings have proved to be a satisfactory stock for plums. The method of propagation is by "shield" budding and nearly cent per cent success is obtained by this method if the budding is done during dry weather. The best period for this operation is during the months of December to January.

As some varieties of plums are wholly or partially self-sterile and as good results are obtained by cross pollination, it is advisable to plant varieties alternately instead of each variety in separate blocks. The spacing to be given depends upon the habit of individual varieties, as some varieties are vigorous growers and some intermediate and dwarf types. The minimum spacing that should be given is 15 ft. But varieties like 'Abundance', 'Shiro' and 'Aloo-Bokhara' require a minimum spacing of 20 ft. One year old budded plants may be planted in prepared pits 3 ft. cube, keeping the union of the scion and stock above the ground level.

It may be necessary to water the plants during the dry months for the 1st year after planting. Afterwards they do not require any watering. During the first year of planting, a periodical inspection of the trees should be made and long growths should be pinched off. When the plants have made some growth, the trees have to be pruned to give them a good shape and all the superfluous and badly placed branches are to be removed leaving strong and healthy branches for further growth and fruit production.

Plum trees bear fruits on the growth of the preceding year and on fruit spurs. The aim of the fruit grower should be to stimulate a superfluous production of fruit spurs and small shoots on the main branches. A judicious pruning every year during the winter months is necessary for good fruit production.

In the case of self-fertile varieties of plums judicious pruning and manuring alone is necessary to guarantee a good crop if weather conditions are favourable at the time of flowering. But in the case of self-sterile varieties artificial pollination is necessary for fruit production. The best time for cross-pollinating is between 1 p. m. and 3 p. m.

Other varieties of plums that can be recommended are 'Kelsey', 'October Purple', 'Wright's Late', 'Czar' and 'Satsuma'. These, excepting 'Czar', are late varieties and start ripening only by the end of June.

Trials with cotton in the second crop season—Agricultural Research Station, Maruteru. Preliminary trials during 1930—1931 in wet-land with cotton sown in September at the Agricultural Research Station, Maruteru, disclosed clearly that such cultivation involving the giving up of the usual first crop paddy would not commend itself for the adoption of the wet-land delta ryot. The proper course appeared to lie in the amelioration of suitable cultural and cultivation methods to grow cotton during the off-season following the harvest of first-crop. The fact that only a portion of the entire wet-land first-crop area in the West Godavari Delta, is put under second crop, added practical and economic importance to this view. The later trials with cotton were therefore designed to elucidate the proper time and '*modus operandi*' for following up a short-duration or medium-duration paddy crop with cotton. The experience gained in subsequent seasons indicated that under conditions obtaining at Maruteru the best time for sowing was during the early part of November after the harvest of early main crop paddy *basangi*. Regarding the method of sowing, dibbling seeds in plough-furrows made $2\frac{1}{2}$ feet apart in unploughed land, and passing the brush-harrow for covering, appeared most suitable. One irrigation about 2 months after sowing was found necessary and beneficial. The bullock-drawn junior-hoe frequently used for intercultivation during the growth stages of the crop, helped to conserve soil-moisture. Pickings of kappas took place during April—June.

Having arrived at the best time for sowing and most suitable method of cotton-cultivation in single-crop paddy-land after paddy harvest, it remained to determine the variety most suitable for such conditions. Trials to ascertain the most suitable variety are still proceeding, but it may be stated that yields of a little over 500 lbs. of kappas per acre have been obtained.

It might however be stated, that the favourable economic considerations which are bound to commend cotton-growing to the Godavari wet-land ryots' attention are, (i) the land lying normally fallow and unremunerative after first crop harvest till the following '*sarva*' planting, (ii) the second crop paddy zone being restricted to a portion only (about one-fifth) of the first crop area, and (iii) the paddy ryots' enforced idleness in the off-season owing to the lack of other subsidiary occupations.

Association of Economic Biologists, Coimbatore.

A meeting of the Association was held on December 1, 1937, at which the following paper was presented :—

Investigation on the Decomposition of Molasses under Paddy Soil Conditions By P. D. Karunakar, M. Sanyasi Raju, T. Rajagopalan and M. Sundaram. When paddy seedlings were transplanted soon after application of molasses to paddy soils (wet lands, Central Farm, Coimbatore,) they were found to die in great numbers. The present investigation was undertaken to determine the causes for their mortality and if possible, to find out the proper methods of applying molasses to soil, which may prove beneficial and not harmful to the seedlings. This investigation naturally divided itself into three different phases of study, namely, (1) agronomic, (2) biochemical and (3) biological phases.

These studies indicated that when molasses was allowed to ferment under paddy soil conditions, under artificial anaerobic conditions in soil and also in liquid medium, there was a considerable evolution of inert gases such as, carbon-dioxide, hydrogen and methane, as well as the production of organic acids, chiefly,

acetic, butyric and lactic acids during the earlier stages of fermentation. It was, therefore, found that the death of seedlings was due, (1) to one of simple asphyxiation by carbon dioxide and hydrogen, or in other words, displacement of oxygen by the gases mentioned above at the root zone of the seedlings, and (2) to the production of organic acids and the dissolution effect they may have had on minerals.

It was noticed in field as well as in pot culture house that these effects, both gaseous and acidic, passed off after a certain time, usually 2 weeks to a month, depending upon the biological population of the soil and the amount of molasses added, leaving the soil once again fit for the growth of seedlings (Abstract).

Crop and Trade Reports.

Paddy—1937-38—Second Fore-cast Report. The average of the areas under paddy in the Madras Presidency during the five years ending 1935-36 has represented 15.3 per cent of the total area under paddy in India.

The area sown with paddy up to 25th November 1937 is estimated at 8,595,000 acres. When compared with the area of 8,504,000 acres estimated for the corresponding period of the previous year, it reveals an increase of about 1.1 per cent.

The increase in area occurs in the Circars (Vizagapatam excepted), Cuddapah, the Carnatic districts, Chittoor, Trichinopoly, Tanjore and the Nilgiris. There has been a marked increase in Nellore (100,000 acres) and South Arcot (71,000 acres) and at the same time a large reduction in area in Vizagapatam (100,000 acres) and Tinnevely (75,000 acres).

The first crop has been generally harvested throughout the Presidency. Normal yields have been reported from Kistna, Kurnool, Cuddapah, Nellore, Salem, Coimbatore, Tanjore, Madura, South Kanara and the Nilgiris. The yield is expected to be below normal in the other districts. The crop has been affected by excessive rains in parts of Chingleput, South Arcot, North Arcot, and Trichinopoly; in the other districts it has suffered to some extent from drought.

The seasonal factor for the Presidency works out at 95 per cent, of the average as against 98 per cent in the corresponding period of the previous year.

The wholesale price of paddy, second sort, per imperial maund of 82½ lb, as reported from important markets on 6th December 1937 was Rs. 2-15-0 in Madura, Rs. 2-12-0 in Vellore and Chittoor, Rs. 2-11-0 in Tinnevely, Rs. 2-10-0 in Trichinopoly, Rs. 2-8-0 in Vizianagaram, and Hindupur, Rs. 2-7-0 in Masulipatam, Rs. 2-6-0 in Guntur and Kumbakonam, Rs. 2-5-0 in Ellore and Bezwada, Rs. 2-4-0 in Rajahmundry and Cuddalore, Rs. 2-3-0 in Cocanada, Rs. 2-2-0 in Anantapur and Conjeevaram, Rs. 2-1-0 in Negapatam and Rs. 2-0-0 in Mangalore. When compared with the prices published in the last report, i. e., those which prevailed on 8th November 1937, the prices reveal a rise of about eight per cent in Hindupur and Tinnevely, six per cent in Negapatam, five per cent in Vellore, and three per cent in Conjeevaram, and a fall of about six per cent in Anantapur, five per cent in Kumbakonam, three per cent in Cocanada and Bezwada and two per cent in Madura, the prices remaining stationary in the other centres. (*Director of Industries, Madras.*)

Cotton Raw, in the Madras Presidency. The receipts of loose cotton at presses and spinning mills in the Madras Presidency from 1st February 1937 to 10th December 1937 amounted to 502,008 bales of 400 lb. lint as against an estimate of 533,100 bales of the total crop of 1936-37. The receipts in the corresponding period of the previous year were 603,279 bales. 419,408 bales mainly of pressed cotton were received at spinning mills and 204,373 bales were exported by sea while 103,784 bales were imported by sea mainly from Karachi and Bombay. (*Director of Agriculture, Madras.*)