

An experiment was conducted recently to study the normal intensity, of infestation in *H. esculentus*. Six mature *H. esculentus* plants, each averaging about 50" in height were enclosed in a bell-jar after being cut into pieces of about 10" length. The cage was started on 15-12-35; the first emergence of *Pempheres* was recorded on 19-12-'35. The emergence of adults continued till 25-1-'36 and gave a total of 96 males and 121 females.

The emergence indicates that *H. esculentus* is a host plant for *Pempheres affinis*. I have observed the insect in other places also on the West Coast, infesting the same crop. The factors responsible for the absence of the pest on cotton here have yet to be studied.

Agricultural Research Station, }
Taliparamba. 17-3-'36. }

E. R. Gopala Menon,
Entomology Assistant.

Gleanings.

New dust replaces Arsenic. Search for a non-poisonous insecticide that might be substituted for arsenic and that, at the same time, would give effective control of insect pests of vegetables, has been rewarded by the discovery of *derris*, a tropical plant from which a dust possessing marked insecticidal properties can be produced. Entomologists at the State Experiment Station at Geneva, New York, have tried out this new material against worms on cauliflower and against the Mexican bean-beetle, with a high degree of success.

"Although *derris* is commonly referred to as a new insecticide, it is well to remember that centuries ago natives of Borneo and the Malay States used this plant as a source of poison for fish and for their arrow heads," says a statement from the Experiment Station on this subject. "The fact that it is non-poisonous to man when taken through the mouth has recently given impetus to its development as an insecticide. The dust is made from the ground roots, and it is generally agreed that the chief active ingredient is a substance known as rotenone. A good grade of powdered *derris* root will contain 4 or 5 per cent. of rotenone." In tests carried on by the Station specialists, ground *derris* root diluted with talc so as to give a dust containing 0.5 per cent. of rotenone has given effective control of caterpillars on cauliflower and of the Mexican bean beetle. The method and frequency of application should follow much the same programme as that employed in the use of arsenical dusts. "In general, it will probably be more satisfactory to purchase the material ready mixed unless the grower has good facilities for mixing dusts," concludes the statement from the Experiment Station. "Owing to the fact that *derris* deteriorates rapidly on exposure to air and light, the container might be kept tightly closed between applications. Dusting should be at the rate of 25 or 30 pounds per acre, and the material can be applied with a power duster or with a good rotary hand duster. In gardens or small plantings, the dust may be placed in a cheesecloth sack and sifted over the plants." (*Scient. Amer.*, Vol. 154, No. 4).

Zinc Sulphate for Citrus trees. Dr. A. F. Camp, Horticulturist at the Florida Agricultural Experiment Station, Gainesville, Florida, has obtained striking results in the use of zinc sulphate sprays on citrus trees affected with frenching. Frenching is distinguished by a yellowing between the veins of the leaves, with the areas along the veins and the edge of the leaf remaining green. If the trouble is severe, the leaves are very small and the twigs short, giving a bushy appearance to the tree. The twigs die back from the tip and are particularly susceptible to cold damage, even in mild cold spells. In the severest forms of frenching,

large twigs and even branches die and the trees become progressively smaller, giving an extremely low yield of small hard fruit.

On a rather heavy soil, orange trees which had been carefully manured and cultivated, had never grown satisfactorily, but applications to the soil of one quarter to one half of a pound of zinc sulphate twice a year, gave a marked response, and normal growth and fruiting resulted in a short time. On the lighter soils of the Florida grapefruit area, however, the soil applications failed to give satisfactory results, and it was thought for a time that a different type of frenching was responsible for the poor growth. It was eventually discovered that the trees responded with exceptional rapidity to zinc sulphate sprays, giving vigorous growth in less than six weeks after the application. The most reliable spray was found to be a zinc-lime mixture of the following composition:—

5 lb. zinc sulphate (89 per cent. pure).
 2½ lb. finely ground hydrated lime.
 50 gallons of water.
 Calcium caseinate or blood added as spreader.

The zinc sulphate is dissolved separately by adding it slowly to a small amount of water with vigorous stirring. The hydrated lime is added gradually to the main bulk of water to make a good suspension, and the zinc sulphate added slowly to this, with thorough mixing. The spreader is either screened into the zinc-lime mixture or mixed separately with water, according to special instructions by Dr. Camp, from whom a copy of the complete circular on the subject of zinc sulphate and water can sometimes be used successfully, but burning frequently results, and such a spray is not recommended. The amount of lime specified above is about the minimum that is thoroughly safe at all times. (*Tropical Agriculture*, Vol. XIII, No. 4).

Milking as an Art. Milking might be defined as an art, inasmuch as some persons are more fitted temperamentally for the work. A person who is rough in manner and irritable in temper can never establish the sympathy between the cow and the milker that is necessary for good results. The milk yield is adversely affected by rough treatment, and the capacity of production over the lactation period is reduced accordingly. Good herdmasters are very careful in the selection of milkers, and will not employ persons who are manifestly bad-tempered or even who profess a dislike for the work. The secretion of milk entails the expenditure of a large amount of nervous energy on the part of the cow. Noise or disturbance, ill handling of cows, roughness in the work, and even spasmodic or intermittent application all tend to check the flow of milk. In the course of a few days decline in production is evident. The system of recording the weight of milk at each milking is an excellent one, and well worth the amount of time the recording occupies. A careful herdmaster will be quick to note any decline in production, and will want to find the reason for it. (*Queensland Agricultural Journal*, Vol. XLV, Part 3).

A new method of making clarified butter. In the older methods and in the method used in most countries today butter is prepared and clarified later. It has been pointed out above that the ripening of cream cannot be controlled very easily owing to the risk of contamination by undesirable types of bacteria. These unwanted bacteria give rise to many side products which though present in minute amounts detract from the flavour of the butter produced. Also over-ripening of the cream with a large production of acid results in a butter of poor-keeping qualities. Further, even when clarified, butter from highly acid cream is more liable to autoxidation than if made from cream of the right acidity.

Also the butter has to be churned correctly otherwise efficient washing is impossible and the resulting clarified butter possesses some of the rancidity developed during the ripening of the cream.

If there is to be any large production of clarified butter much of the work will have to be left to natives. This means that the less skilled the work, the more capable will the native be to carry it out. The making and washing of butter is a skilled business, but turning a separator is mechanical. Clarifying butter has been regarded as an art, though, as shown earlier, if certain observations are made then it loses its right to be regarded as such.

In any case the boiling process cannot be eliminated.

In an effort to simplify the production of clarified butter so that a first class article could always be turned out, the direct boiling of cream was tried. Cream contains very much more protein and water than butter and the only reason for making butter as intermediate step in all the older processes is to reduce the quantities of these before boiling.

As was to be expected, both in the laboratory and creamery tests on the boiling of fresh cream, the direct boiling was not a success.

The large amount of protein present caused some to stick to the bottom of the pan and char, thus reducing the quality of the final product.

An attempt was then made to reduce the amount of protein present by washing the cream with water. This was accomplished by mixing the cream with water so as to make a volume equal to half that of the original milk separated. This cream emulsion was then re-separated. By this means the protein content was reduced to about the same percentage as is found in butter. Laboratory trials showed that this washed cream could be clarified without difficulty. Further trials on this method have been made on the Government Dairy Farm and on a large scale in one creamery. All the reports show that this method is working perfectly satisfactorily under creamery conditions.

In this washed cream method the small amount of rancidity present in the freshly-separated cream from native milk is partially removed by washing. The small amount left in the washed cream disappears during boiling. The result is that the product can be guaranteed absolutely free from rancidity. Further, since it is made from fresh cream its keeping qualities are better than that from butter produced from acid cream.

By general consent this clarified butter is graded as the best turned out in the Territory. It has a good colour, is always solid below 30°C and in my opinion is better than the best Indian-made article. Its taste resembles butter very closely. The Vitamin A content of this fresh cream clarified butter is much (3 times) higher than in the normal creamery product.

The loss of butter fat in re-separating the milk will not be more than is lost in the buttermilk, the butter left in the churn and on the butter-working table. Yields from the creamery confirm the small scale laboratory tests that there is no appreciable difference in yield of clarified butter between the standard and the new methods.

The washing of the cream and re-separating is absolutely mechanical and eliminates the need for an intelligent butter maker. This means that there is a saving on the utensils and skilled labour whilst a better product is turned out. (*Extract from the Bulletin of the Imperial Institute for January—March 1930. Vol. XXXIV, No. 1, P. 42.*)

WEEKLY MENU VEGETARIAN

AT MINIMUM COST. Suitable for manual workers.					AT MODERATE COST. Suitable for brain workers.			
DAYS	7 A. M.	12 NOON	4 P. M.	8 P. M.	7 A. M.	9 A. M.	1-30 P. M.	8 P. M.
Mondays Wednesdays Fridays	Rice roti & nut-cake chutnee.	Kitchri & ghee, vegetable curry and curds.	Soya bean coffee.	Rice and dal, roti, butter. Salad of sprouted grams, vegetable curry, or banana.	Soya bean coffee.	Rice & dal, ghee, salad of sprouted grams, vegetable curry and curds.	Ladu, cocoanut chutnee.	Roti, butter, vegetable curry, curds and fruit.
Tuesdays Thursdays Saturdays	Do.	Roti, ghee, vegetable curry, raw onion & curds.	Do.	Rice and dal, ghee, salad, vegetable curry and curds.	Do.	Rice & dal, ghee, salad vegetable curry and curds.	Roti, nut-cake chutnee, banana.	Kitchri, roti, butter, vegetable curry, and curds.
Holidays or alternate Sundays	Soya bean coffee or tea.	Rice and dal, ghee, puri and some pudding, salad, vegetable curry. 'Usal' of sprouted seeds & curds.	—	Rice, vegetable curry and curds	Do.	Rice, dal & ghee, puri and some pudding, salad, vegetable curry. 'Usal' of sprouted seeds and curds.	—	Roti or rice, vegetable curry and curds.
NON-VEGETARIAN								
Mondays Wednesdays Fridays	Rice roti & nut-cake chutnee.	Kitchri, egg and vegetable curry.	Do.	Rice and dal, roti, vegetable curry and salad.	Do.	Rice & dal, ghee, roti, egg & vegetable curry and salad.	Ladu, cocoanut chutnee.	Rice & dal, roti, vegetable curry and fruit.
Tuesdays Thursdays Saturdays	Do.	Roti, egg and vegetable curry and raw onion.	—	Kitchri, meat and vegetable curry, salad of sprouted grams, curds and fruit.	Do.	Do. With salad of sprouted grams and curds.	Roti, nut-cake chutnee, banana.	Kitchri, ghee, meat or fish and vegetable curry.
Holidays or alternate Sundays	Soya bean coffee or tea.	Rice & dal, puri and some pudding or meat or fish preparation, salad, vegetable curry, 'Usal' of sprouted seeds and curds.	—	Rice and vegetable curry.	Do. or tea.	Rice, dal & ghee, fish or meat preparation or puri and some pudding, salad, vegetable curry and curds.	—	Roti, vegetable curry and fruit.

Menu for Children.

Feeding times for children should generally be those mentioned for brain workers. They should be given a cup of milk or one egg and soya bean coffee extra at 4 P. M.

Directions.

1. The above are only specimen menus. Many other preparations and combinations of foods can be substituted for those recommended above provided they are done in keeping with the advice given in the pamphlet on 'Balanced Diets'. The meals recommended for morning and evening are interchangeable. Where whole milk is cheap i. e., one anna and a half a lb., it should be used instead of skim milk and butter.
2. In the case of those taking the minimum cost diet 'Broken Rice' should be understood wherever 'Rice' is mentioned.
3. 'Kitchri' is usually made of rice and either tur dal or masoor dal (2 parts of rice and one of pulse).
4. Malted Jowar:—About 6 ounces of jowar should be malted and used in one week.
5. 'Rotis' are to be prepared of *mixed flour* of the following ingredients except bran. They should be mixed in the following proportion and sent to the local mill. Fresh bran should be added to the flour twice a week.

Malted jowar about 15 per cent.	Malted jowar	about 15 per cent.
Soya beans " 20 "	or Soya beans	" 25 "
Bran " 15 "	Bran	" 10 "
Wheat " 50 "	Rice, bajri, or jowar	" 50 "
6. 'Usal' is a cooked and spiced preparation of sprouted pulse seeds.
7. Soya Bean Coffee:—The beans are roasted like coffee beans and ground to a fine powder for use.
8. Some of the ground-nut cake should be used for chutnee and the rest should be mixed with dal, curries or 'usal'.
9. Salad:—Tomato, yellow carrots, cucumber, raddish, onion, cabbage etc., and some leafy vegetables can be used uncooked. Clean them in cold water and then in hot water so as to remove dirt and destroy insects etc., cut to pieces and add curds and condiments to taste. Sprouted horse grams should be used uncooked with or without the addition of salads given above.
10. Skim Milk Curds:—Churn the milk powder in water (1:9) and boil for five minutes. Prepare its curds just as you do of ordinary milk.
11. Lunches should be home-made and should be taken to the office or factory in a tiffin carrier.

(The Bombay Presidency Baby and Health Week Association).

Review.

Indian Forest Records: (New Series). *Entomology*: Vol. I., No. 6., "On the Biology of the Braconidae", pp. 105—138 (1935); No. 8., "On the Biology of the Ichneumonidae", pp. 151—168 (1935); No. 9., "On the Biology of the Tachinidae", pp. 169—184 (1935). By C. F. C. Beeson and N. C. Chatterjee. Messrs. Beeson and Chatterjee of the Forest Research Institute, Dehra Dun have done a distinct service in the cause of biological control in bringing to light the parasitic fauna on some important forest insects chiefly forest defoliators and borers, mostly Lepidopterous and Coleopterous ones. These parasites must be studied in conjunction with a paper on "The Biological Control of Teak Defoliators" by C. F. C. Beeson (Indian Forester, Vol. 60, pp. 672—683, October 1934), wherein the author discusses the theory of biological control in connection with the two teak defoliators