

4) The milking period of Arab cows may be considerably lengthened through rational feeding.

5) The annual depreciation of an Arab cow amounts to 8—10% of her value.

6) The management of the Arab dairy herd at Beth Alfa and similar places on an economic basis, considering the fall in price of milk, is possible only with an average production of 900—1000 litres per cow.

7) The rational utilization of the pasture expenditure (labour) requires a dairy of at least 50—60 head per attendant-shepherd and 100—200 cows per two shepherds.

#### B. The problem of Dutch-Arab cross-breeding.

##### a. Zootechnical estimate:

1) The progeny of this crossing show a market improvement in their body, temperament and production. It can be assumed that thanks to this system it is possible to arrive also in the first generation (through proper selection) to an improved cross-bred cow producing 3000 litres milk per annum.

2) The cross-bred Dutch-Arab cow does not completely inherit from her Arab mother immunity against pyroplasmosis.

3) As to hereditary character of milk fat no judgment could be made on account of the scanty material available for this purpose. The average for seven cows was 3,91%.

4) The cross-bred cow is unable to utilize the pasture to the extent of the Arab cow; in order to preserve the body and height of production she must receive a feeding in the cowshed.

##### b) General:

The establishment of a dairy herd of Dutch-Arab cows with an average milk yield of 3000 litres, under the conditions of Beth-Alfa will cost L.P. 50 per head, not including the losses which may result through selection in the herd of cross-bred cows.

#### Notes on the Manuring of the Vegetable Garden

by S. Zemach and N. Naftolsky.

1. We dealt with the problem as to what extent a heavy application of organic manure is justified from the economic

point of view and whether there is any possibility of applying chemical fertilizer as substitute.

2. For this purpose a demonstration garden was laid out at Geva and the following vegetables planted: cauliflower, cabbage, red beet, stock beet, carrot, green onion, dry onion. (For detailed plan of the field see Page 48).

3. The results obtained were as follows: the fertilizers of formula H (see Table I, p. 48) gave the maximum yield in all cultures. The greatest increase per ton of organic manure was effected by the first two tons. The heavier the application of organic manure the weaker its effect in most cases.

Chemical fertilizer combined with organic manure (see formulae F—G) generally causes an increase in the yield, which costs much less than the increase obtained with organic manure alone.

In most cases the influence of the organic manure increases when combined with chemical fertilizer.

4. For example, while each ton of organic manure applied to carrots, without being combined with chemical fertilizer (see formulae B, C, table 2, p. 50) produces an increase in the yield of only 128 kgs., the formulae of organic manure combined with chemical fertilizer (formulae F—H) produces in the same carrots an increase in the yield of 237 kgs per dunam per ton of organic manure. This appears to be the case also with stock beet. Each ton of organic manure in formulae B, C produced an increase of 835 kgs, whereas in formulae F—H there resulted an increase of 2279 kgs per ton of organic manure. These differences are not so salient in regard to red beet, the yield of which was generally not too high. But here too the general aspect is equal to the former.

5. Green Onion (see Table 4, p. 53). Here too we observe a constant increase in the yield according to fertilizers applied. In one spot this increase is absent, in formulae H—the heaviest application (8 tons of org. man.), and the two additional tons of org. man. (in comparison with formula D—6 t.) have no effect on the increase of the yield.

Also the other heavy applications of org. man. (like in formula D) increase the yield only slightly.



Contrary to this, the effect of the chemical fertilizers is rather conspicuous. Firstly, they increase the general yield of the onions and second, they strengthen the influence of the org. man. with which they are combined. For example, in formula H as compared with formula F, both of which contain a full and equal amount of chemical fertilizers, the former having 4 tons of org. man. and the latter 2 tons only, the increase of the yield per ton of org. man. amounts to 132 kgs, whereas in formula C as compared with B, containing org. man. alone, the increase amounts to 59 kgs only per additional ton of org. man.

6. The relation between leaves and fruits of carrot and red beet became lower owing to the influence of the chemical fertilizers. For example in formula G (see Table 5, p. 54) the ratio for red beets is 100:54 and for carrots 100:21,8, both being the lowest ratios.

In the heaviest applications like in formulae E—H the ratio is somewhat higher than in the preceding applications of fertilizers.

7. After all these explanations we do not wish to state that there is no necessity of applying large amounts of org. manure to garden soils. In fact, in some cases this is highly necessary. When a vegetable garden is laid out on a certain spot for many years, and especially in soils deficient in organic matter, it is surely worth while to give the soil an "advance" of org. man. which will be exploited during many years. It is particularly necessary for the physical improvement of the soil. In such gardens it is desirable to apply an amount of 6 tons of organic manure per dunam.

However, even this heavy application of manure does not relieve the gardener of the necessity of adding chemical fertilizer; owing to the fact that the latter does not only have its own effect but also, as mentioned before, increases the influence of the organic manure.

In intensive gardening no organic manure should be spared, but here too chemical fertilizers are highly effective and should certainly not be applied sparingly.

The case is quite different in large commercial gardens and farms; here there is room for the extension of the vegetables area or that of other intensive cultures, but these areas are,

however, limited by the amount of organic manure available on the farm. In such gardens it is unreasonable to apply large amounts of organic manure. The fertilizing value of each ton of manure of these heavy applications does not reach that of each ton of either the limited or moderate amounts.

It appears to us that the most rational formulae are E, F, G in our fertilizer demonstration fields, which are in accordance with the capacity of the farm and the requirements of the various kinds of vegetables. We recommend these formulae for practical work in the farms.

### Fertilizer Experiments in Vineyards and Almond Groves

by Dr. A. Naïm.

In 1923—24 we arranged several plots for experimental fertilization in three almond groves and two vineyards. The purpose of these experiments was to determine the influence of the following chemical fertilizers: double superphosphate, potash and Chilian nitrate of soda, the effect of the combination of all these fertilizers, or of each kind separately or when combined with organic manure.

In regard to the yields we have to point out the following:

1. Almond Groves. The yield of the Palestine almond groves are generally low owing to the lack of moisture in the soil, the irregular distribution of the late rains and to a certain extent also as a result of inadequate cultivation (the fall in prices of almonds and the desire of planting orange groves have caused the farmers to neglect their almonds groves).

The results of the fertilizer experiments have demonstrated:

a) first of all the positive effect of lime. Either when applied separately or in combination with other chemical fertilizers it increases the yield to a great extent.

b) the beneficial effect of Nitrogen when combined with other chemical fertilizers.

c) formula of fertilizers with a maximum amount of Nitrogen gave the best results.

d) organic manure increases the yield to a great extent.

e) the yields are increased even to a greater extent by applying phosphorus together with organic manure, but in the absolute sense the increase is small, as in these rows the yields were generally very scanty.

In spite of the fact that the fertilizers in the above-mentioned