

In very many cases fertilizer mixtures are quite unnecessary for citrus trees, and growers could economize by changing over to single fertilizer alone. In other cases it is quite possible that the amounts of fertilizer given are excessive, and could be cut down quite safely without causing a drop in yields. Growers would not only help themselves by such economies, but would leave more fertilizers to those farmers who might otherwise be forced to do without them.

Any growers interested in this subject, and wishing the Department to report on the probable fertilizer requirements of their orchards as indicated from leaf analyses are cordially invited to communicate with the Chief, Division of Horticulture, P. O. Box 994, Pretoria. No charge will be made for this service, and the grower will be under no obligation to carry out suggestions which may be made. *Farming in S. Africa, Vol. 18, No. 206, May 1943.*

Intensified Potato Culture in the U. S. S. R.

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At the outbreak of war the Russian Agricultural Research Stations devoted themselves to the problem of maximum production of food and raw materials in the U. S. S. R. The potato, yielding as it does the highest amount of human food per acre of any crop in common cultivation, naturally figured prominently in the plan. The necessary large increase in potato acreage raised several serious problems in regard to the supply of seed tubers, and the way in which these difficulties are being met is an interesting example of the work of Russian scientists during the war.

Tips as Seed The first problem was to reduce the tonnage of potatoes taken for seed to an absolute minimum. Something much more drastic than the usual cutting of large potatoes into two sets was required. The solution came from Professor Lysenko and his colleagues at the Lenin Agricultural Science Academy who developed a method of saving for seed the tips of potatoes that were to be used for domestic or industrial purposes. The procedure was to cut off quite a small portion of the rose end of the tuber with the buds attached and collect and store the tips in such a way that their vitality was preserved until planting time. The remainder of the tuber was used as food. The weight of the tip being only about $\frac{1}{2}$ oz., the quantity of food material used for seed could therefore be reduced to about one-quarter of the normal when this procedure was adopted. By organization, demonstrations and the issue of working instructions, some 380,000 acres were planted with tips in 1942, representing a saving of thousands of tons of seed.

Comparisons of the produce of tips with that for whole seed under field conditions showed that the yield from the tips was much the same as that produced by ordinary seed potatoes. The idea has been carried still further by Professor Yakushkin of the Timizyazev Agricultural Academy, Moscow. He proposes a method of "tuberless" sowing of potatoes. The eyes are cut in spring and planted in boxes or forcing houses, and in May the young plants are put out in the open. At least three-quarters of the original tuber is saved for food by this method and it is claimed that the plants grown from eyes are 15—20 days earlier than those from ordinary seed tubers (in 1942 at any rate), and that they yielded quite as well.

Two crops in one season Other physiological studies on potato seed have been directed towards controlling the period of dormancy of tubers. In certain parts of the U. S. S. R. it would be quite practicable to secure two crops of potatoes in a single season if seed dug in early summer could be planted the same

year. Normally this is not possible because such seed would not germinate. It has been found that the length of rest period in potatoes depends on external conditions and particularly on the supply of oxygen to the inside of the tuber. The skin of new potatoes prevents the penetration of oxygen. If the skins are removed and prevented from reforming, the tubers will germinate in 7—10 days. Methods for carrying out these requirements in practice have been worked out and successfully tested on collective farms in the irrigated areas of Central Asia. The results of this work will increase the potato area in southern regions in 1943.

The practices outlined above clearly demand an appreciable amount of detailed organization, extra care, and trouble. In normal times they would probably be discountenanced as tending to deterioration of stocks but their value in a state of emergency is undoubted and reflects the energy with which every avenue of production is being explored in the U. S. S. R. *J. Min. Agri.* 50 (1943): 20—21.

Abstracts

Production Recording Scheme (*Food per Acre* by R. H. Smith. *J. Min. Agri. London Vol. 49, No. 4, March 1943.*) So far, judging farm management efficiency has been difficult, with the basis of money returns, per acre or per unit of labour, as the criterion. This has been complicated by the diversity in the types of soil and farming.

The plan A new plan conceived by Captain L. R. Bomford, of Tufton Warren solves the problem in an ingenious and simple manner. It is characterised by (1) simplicity in keeping records, (2) simplicity of results obtained after the results are collated, and (3) results lending themselves for comparison of even different types of farming. Records were maintained according to the new plan for 28 farms in Whitchurch district for 1941—42. A monthly return of all sales and purchases of produce, livestock and feeding stuffs was prescribed, — corn and milk by measure, potatoes, feeding stuffs etc. by weight, and eggs and livestock by number. The information so obtained was summarised for the year, the June return giving the opening and closing stock.

Assessing results The commodity sold off the farm is translated into the acres, that should have been adequate, by dividing the actual sales by the standard yield of the district that is fixed. In the case of animal produce, the output per animal and the acreage that will maintain the animal furnishes the standard for the animal produce. Thus the year's output is converted into the number of acres from which it should have been obtained. From this is deduced the number of acres that should have produced the feeding stuffs received during the year. This net acreage is represented as a percentage of the farm area and is a measure of the efficiency of management. The result depends on the yield of crops, the effective utilisation of produce by livestock, the efficient use of machinery, labour etc., and efficient marketing. The efficiency percentage is a true index of the farmer's ability to manage farms in any locality and farms are comparable irrespective of the type of farming, provided the soil conditions do not vary widely. Where soil conditions are divergent, different standard yields may have to be assumed.

Weakness revealed The variation in efficiency of the 28 farms in Whitchurch varied from 31 to 106 %, with the majority lying between 50 and 70 %. The efficiency was not correlated either to the size of the farm or the type of farming. The low level of the results was not expected by the farmers concerned. The low level indicates that all the several departments of the farm do not give a uniform and high output as is presumed by the complacent. The low and high outputs in the different sections tend to counter-balance each other and