Gleanings

Storing of Fertilisers: Chemical fertilisers are to-day of importance not merely because they allow farmers to farm more economically, but because they are indispensable for intensive cultivation. Consequently, the problems of the fertiliser industry are of importance not only to makers and users of fertilisers but to the whole world.

One such problem recently became urgent and its speedy solution by British scientists is already having important results in the use of fertilisers. It concerns the caking of fertilisers when they are stored—at first sight a trivial problem, but in fact one of very great practical importance in food production.

Every farmer knows that if he puts bags of fertiliser into store the contents tend to cake into a hard mass like cement. This occurs especially among the bags at the bottom of the pile, which get squashed the most, and when, as often happens, the storeroom is not warm and dry. This is a serious problem because fertiliser must be evenly applied to get the best results and this is impossible unless it is in the form of a free flowing powder. The difficulty is particularly great when it is to be drilled simultaneously with the seed. The farmer has to waste a busy season when he can least afford to do so.

Two Solutions: The industry has already found two ways of solving the problem, but, unfortunately, the demand for fertilisers is now so huge that the solutions cannot be applied to the industry's total output. One solution is to store fertilisers in huge bins and deliberately allow them to cake. Then they are ground up a second time and it is found that there is then little caking tendency left. This was quite feasible as long as the demand for fertilisers was seasonal—chiefly in spring—because this left several months of the year free for them to mature in their bins. Now, however, the demand for more and more fertilisers is incessant. Production takes place all the year round and the huge storage space required for this method is no longer available.

The second solution to the problem is to form fertilisers into little hard granules which do not stick together nearly as easily as the usual fine crystals. However, as well over a million tons of fertilisers are used every year in Britain alone, there is not—nor is there likely to be for a long time—nearly enough machinery to deal in this way with more than a fraction of the flood of material.

Because of the urgency of the problem, chemists of the Department of Scientific and Industrial Research were asked to find a solution quickly—in fact within eight months. This short time limit immediately disposed of any ideas chemists may have had about making a thorough laboratory study of all the factors involved and then proceeding logically to a remedy. Instead, they had to apply all their scientific knowledge and intuition to finding by rule of thumb means some remedy—not necessarily the best or the only one—which would quickly relieve the situation.

Caking Tendency: Firstly, they had to work out a way of measuring the degree of caking. This was finally done by measuring the pressure necessary to make specially prepared cakes crumble up. The more severe the caking the greater the pressure needed to break it up again.

Next, it was decided that the most likely way of solving the problem would be to mix into the fertiliser some powder which might keep the crystals apart and so stop them from caking. It is perhaps much the same idea as dusting newly amended tyre puncture with chalk to stop the inner tube from sticking to the cover.

The powder they sought, apart from minimising caking, had to fulfil a number of conditions. It had to be possible to add it to fertiliser during the dry mixing process, it had to be harmless to plant and soil, cheap and available in the U. K. in quantities of

10,000 to 15,000 metric tons a year. Not all substances tried out would fulfil these conditions, but it was essential to examine a sufficient range in order to obtain some idea of the types of material which might be serviceable.

With little to guide them, the chemists patiently tried the effect of mixing various powders into the fertiliser and then they measured the caking tendency of the product. The powders they tested were extraordinarily varied and included fish meal, brick dust, powdered seaweed, sawdust and dried blood.

Best Agents: Powders of mineral origin—such as brick and stone dust—proved quite useless. Indeed, they made matters worse rather than better. Finally, shredded peat or sawdust were found to be the best agents, reducing caking to between one-third and one-fifth of what it was when no conditioner was present. Chopped straw is just as effective but not so easy to handle. The addition of peat or sawdust—about one part in 30 is needed—will not lower the value of fertilisers because manufacturers always add a small quantity of filler to make the proper balance between different plant nutrients. All that will be necessary will be to replace a part of the filler with sawdust or peat.

Quite apart from the anti-caking agent, storage conditions too are important. Bad storage and exposure to weather can cause much more severe caking than when fertiliser is kept dry.

It seems a far cry from the prevention of an apparently minor defect in a product the general public rarely sees, to an important increase in the world's food supplies. Nevertheless, this is the result which will be obtained, for the new discovery means that far greater quantities of fertiliser will be available for the farmer in good condition at the time they are needed. (British Information Service / 341).

Weeds May Become Assets: Agriculturists in Australia believe that at least three weed pests can be turned into profitable crops. There is a strong possibility that the saffron thistle (*Carthamus lanatus*) which is on the Australian list of prohibited noxious weeds will be cultivated as a crop. The seed has good oil properties and is valuable as turkey feed. One firm of oil and fodder cake manufacturers is buying seed at 6 pence a lb. Last year when harvesting experiments were carried out with saffron thistle, it was found that the crop could be reaped with a normal harvester provided that every alternate tooth was removed from the comb. The seed is larger than wheat grain and must be harvested before absolutely ripe or the oil content deteriorates.

Samples of another weed, *Sida rhombifolia* or common sida, are being sent to England to discover whether the plant can be used in place of Indian jute for making hessian and sacking. Experts believe that the fibrous nature of the plant should make it suitable for sack-making. Experiments with the seed of wild turnip (*Brassica tournefortii*) for the extraction of oil promise a use for this weed, now considered a menace by wheatgrowers. A South Australian miller who is already exporting large quantities of mustard seed oil to India and south-east Asia claims that he has produced equally good oil from wild turnip seed. The oil has the same purity (98 per cent), tastes sweeter, has clearer colour and will not go rancid. It can be used for culinary purposes and as a base for perfume and cosmetics, while the residue makes good laying mashes for poultry farmers. AGN. / 227.

Rain by Radar: Radar is being used by a group of Australian scientists from the Council for Scientific and Industrial Research in experiments with the object of making rain. They are concentrating on three phases:

(1) Studies of the effect of "seeding" clouds with dry ice pellets (2) study of clouds structure (3) Development of instruments to measure physical conditions in and around cloud.

There are, however, many problems to face. Speaking on the experiments, the Minister in charge of the Council for Scientific and Industrial Research, the Hon. J. J. Dedman said: "First you have to find the clouds. Then there is the prospect that some people in the area chosen for rain-making do not want rain, and the question arises whether the Government will be liable for damages for causing rain to fall". (AGN. / 227)

New Farm Compost: In Australia, a Municipal Council is turning garbage into an organic manuring material, similar to compost. Garbage rich in discarded food is preferred. After picking over for tins, metal and glass, the garbage passes by conveyor belt to a hopper. Here bacterial seed, in earth, and a small amount of lime, are added and the mixture conveyed to the bacterial digester. In this 50-ton container, the matter is slowly stirred and mixed together for two days. The bacteria, it is claimed, converts the garbage into good manure, which Government analysts say will eventually turn into compost. From 100 tons of garbage about 50 tons of marketable product is obtained. This sells at £A5/15/- a ton bagged or £A3/15- in bulk. A quantity of the manuring material has already been sold to the Murrumbidgee Irrigation Area in New South Wales, and 500 tons are on order for banana growing at Coffs Harbour, northern New South Wales. (AGN. / 229).

Butter-Tainting Weeds Traced: After an Australia-wide survey of all weeds believed responsible for tainting butter, scientists have isolated three plants which they consider do the most damage. Weeds are: *Coronopus didymus*, (lesser swine cress or carrot weed); *Lepidium hyssopifolium*, (pepper cress, mustard weed or pepper wort); *Lepidium beonariense*, (rubble pepper cress and mustard weed). Weed taint causes thousands of tons of Australian butter each year to fall below the choicest standard quality. Officers of the Australian Council for Scientific and Industrial Research, the Queensland Butter Board and the Queensland Department of Agriculture and Stock have made an extensive study of weed taint at Gatton College, Queensland. Plants selected from the Australia-wide survey as being most likely to impart taint to butter were used in feeding trials. At the same time, laboratory tests were carried out in an effort to eliminate taint from butter. Now that the three weeds causing the most trouble have been discovered, dairy farmers have been advised to eliminate them from grazing paddocks, and to conserve fodder as alternative feed-stuffs for cows so that their intake of tainting plants will be reduced. So far no satisfactory method of extracting taint from butter in the factory has been evolved. (AGN. / 228).

More Tomatoes from Spray Irrigation: Quickening Australian farmer interest in spray irrigation and rapid engineering advances in this method have prompted experiments in the Murrumbidgee Irrigation area of New South Wales, which show that spray irrigated tomatoes grown on heavy soil give better yields than furrow irrigated plants.

Comparative yields were:— Furrow irrigated 6·4 tons to the acre.
Spray irrigated 10·1 tons to the acre.

In the first month, when furrow irrigated plants were receiving more water than spray irrigated plants, growth was more rapid in the former because of rapid initial soakage in the freshly made furrows. Towards the middle and end of the season, however, the spray irrigated plots rapidly overtook and surpassed the furrow irrigated ones. The experiment established that spray irrigation of vegetables on heavy soil is both practical and economic and is distinctly advantageous where moderate salting is present. (AGN. / 228).

Toxaemic Jaundice Discovery Made: Agricultural scientists in Australia have discovered that heliotrope weed (*Heliotropium europaeum*) causes toxaemic jaundice in sheep. This weed had often been suspected as a poisonous plant, but laboratory tests and experiments with groups of sheep had failed to prove that it caused jaundice. This was because the poison takes a long time to work through the blood stream to the liver and it is only when the poison accumulates in the liver that it proves fatal. Toxaemic jaundice has killed off many crossbreed sheep in Australia in the last 20 years. Now that one of its causes has been discovered, fat lamb production can be expected to increase. (AGN. / 228).

Agricultural College and Research Institute Library, Lawley Road, Coimbatore.

MONTHLY LIST OF ADDITIONS FOR FEBRUARY 1949

1. BURTON (W. G.): Potato a survey of its history and of factors influencing its yield, nutritive value and storage 1948
2. COLLINGS (Gilsort H.): Commercial Fertilisers, their sources and use Edn. 4. 1947
3. FLETZ (David): Atomic enegy now and tomorrow. 1946
4. EASTER (Stophen S.): Preservation of grains in storage: papers presented at the International meeting of infestation of food-stuffs, London 5th –12th August 1947. 1948
5. FAULKNER (Edward H.): Ploughing in prejudices. 1948
6. GILBERT (Frank A.): Mineral nutrition of plants and animals. 1948
7. HABLER (Agaes W.): Garden in the plains Edn. 3. 1948
8. HAYES (B. C.): Techniques of Observing the weather. 1947
9. KENT JONES (D. W.) and AMOS (A. J.): Modern Cereal Chemistry Edn. 4. 1947
10. LYON (T. Lyttleton) and BUCKMAN (Hary O.): Nature and properties of soils Edn. 4. Revised by Harry O. Buckman. 1948
11. MARKLEY (Klare S.): Fatty acids, their chemistry and physical properties 1947
12. RANGANATHAN (S. R.): Preface to Library Science. 1948
13. RANGAPPA (K. S.): and ACHAYA (K. T.): Chemistry and manufacture of Indian Dairy Products. 1948
14. SHAW (K. T.) *Ed:* Land policy, Agricultural Labour and Insurance 1948
15. SMITH (K. M.): Text book of Agricultural Entomology Edn. 2. 1948
16. WHITE (John M): Farmers Handbook. 1948
17. BRITISH MYCOLOGICAL SOCIETY: 1896—1946: Proceedings of the Jubilee Meeting held in London 20—25 October 1946. 1948