

in the hands of the economic plant breeder. In recent years with the advent of the concept of vernalisation, great significance has been attached to the "germination" phase of plant development, and it is now well recognised that by appropriately treating the seed during germination the developmental phase can be profoundly modified. If it were possible to correlate the physiological activity during germination with vigorous after-growth, the geneticist would be saved much time and labour in plant selection.

With this object in view, an investigation was undertaken on the changes taking place when the paddy grain is allowed to germinate under a variety of controlled conditions. The individual role of embryo and endosperm and of the enzymes diastase, maltase and catalase have been studied. The accompanying graph shows the changes in the diastatic activity of the whole seed during germination under the condition studied. It will be seen that carbondioxide has a marked effect on diastatic activity. If germination is under water, the oxygen content and volume of water, and the degree of submergence influence enzyme activity. Growth-promoting substances cause a small increase of diastase.

The experiments, full details of which will be published shortly, show that growth as indicated by weight of seedlings or morphological measurements does not bear any strict relationship to the quantity of diastase produced during germination.

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ABSTRACTS

Preservatives for wooden and bamboo posts against ground-inhabiting termites. (*The Philippine Agriculturalist* Vol. XXV No. 8). In an attempt to find some cheap and effective preservative against the attack of termites which quickly destroy posts, fences, and other structures that are in contact with the soil, bamboo posts and ipil-ipil (*leucienia Glanca*) were treated with coal tar, salt and paris green. Two hundred grams of salt and about sixtyfive grams of paris green were put into the holes into which the posts were fixed. In the case of coal-tar, the parts of the posts to be set in the ground were dipped in coal tar. Controls were also run side by side.

All the three preservatives were found to be generally effective in wooden posts, salt coming with 66.7 % attack, followed by paris green (70%) and coal tar (90%) on bamboo paris green showed 40 % attack, salt 60 % and coaltar 70 %.

Regarding the economics of the treatment, coal tar is the cheapest, in the cost of treatment being annas five; followed by salt with annas ten for 100 posts. Paris green treatment was prohibitively costly, as the figure came to about three annas and a half.

The fungicidal effect of salt and coal tar was not significant. In this, paris green was the most effective.

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Broiler Factories by Philip-H. Smith. (*Scientific American*, 1937 pt. 12). The article deals with the mass production of eggs and broilers in the factories situated in the heart of cities. The growth of the factory idea may be gauged from the fact that there are more than 10,000 installations and that one hundred of the bird population of the United States has been thus caged. Poultry branch of the farm activities has been industrialised, moved bodily into heart of big cities and great economies in the matter of transport accomplished through the new system of 'battery brooding'. The birds are confined from the first day of their life in wire cages and pass through three stages of (1) starting (2) growing (3) developing. After the last stage the males are sold as broilers and females are carried to the fourth stage as egg layers. The number of birds is successively

reduced at each stage till the laying hen has a cage of her own. The eggs as soon as laid roll out of reach, are recorded and collected, and when the egg production falls below a standard, the birds are sold, and the places occupied by better workers. The arrangements are perfected so that no litter is scattered and no food or water is wasted. The lack of sunlight resulted in rickets and this was overcome by feeding with cod-liver-oil. The problem of cannibalism was overcome by a trick. Ruby coloured glass windows and coloured light bulbs solved the trouble. The cannibalism was suspected to be due to the sight of blood where the pin feathers came through the skin and the red light neutralised the effect. The freedom of the birds from soil and litter results in a disease-free condition. A controlled ventilating system is designed to give a plentiful oxygen supply to each bird. Prolonged tests have shown that under these controlled conditions of temperature, light and humidity, the seasonal fluctuations of a neutralised bird are eliminated. There is no scattering of rations and hence feed-cost is reduced. Under natural conditions 100 birds is the limit of bird density per acre and beyond which, it will breed diseases due to crowding. As an example of the efficiency of battery brooding, M. H. Arndt experimental plant houses 16,000 birds on less than one acre and all labour is performed by two men only. The revenue from the droppings amounts to roughly the cost spent on labour. The freshness of products and lower breakage losses due to reduction in the distance transported, are other points in their favour. Breeding for confinement-minded birds are being done and among other incentives tried music has been found to induce better laying. Attempts to make better use of the dropping as fertiliser are being made. The volatile products like ammonia of the litter are being captured by placing chemicals on the belts, and if successful will result in a better utilisation of the waste and by-products. The factory idea will be unprofitable, if new structures are to be erected, but the establishment chiefly depends upon the ability to rent or purchase obsolete structures which do not possess any economical value for other enterprises.

R. B.

Agricultural Jottings

BY THE DEPARTMENT OF AGRICULTURE, MADRAS

Cattle Breeding. A Dairyman or ryot who owns a herd of cows and supplies milk all the year round to his customers has to regulate the calving of his cows throughout the year to fulfil his orders and keep up a uniform supply. It is therefore important that he should know something about the "Oestrus" in cows or "the period of heat." This is the time when the cow calls for the bull.

A heifer will come on 'heat' for the first time any time from the age of 2 to 4 years according to the state of her maturity, condition, environment and feeding, i.e., an early matured heifer reared under good conditions will take the bull much earlier than one which is underfed and undersized. In temperate climates, cows come on heat about 3 weeks after calving and every 3 weeks after that until they conceive; but in India, the indigenous cows vary from 3 weeks to a year or more after calving and their periods are very irregular. On the average the Indian cow in good condition will conceive about 3 to 4 months after calving. Some people are under the impression that a cow will conceive at any time if covered by the bull. This is not so, a cow must be properly "on heat" if she is to conceive. It is therefore waste of time taking her to the bull unless she shows the signs of "Oestrus."

It is very easy to see how a heat period in a cow might easily be missed. There are often no apparent preliminary symptoms of approaching heat, such