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AN IMPROVED ALL-METAL SEED-HOPPER

By R. SWAMI RAO, L. Ag.,

Superintendent, Central Farm, Coimbatore.

The importance of the seed-drill in cheapening the cost of crop production is very well known. It economises labour in sowing a large area. More uniform distribution of seed is assured than in broadcasting. Inter-cultivation of crops with bullock power is rendered possible. Above all, it ensures a better return from the land, which is what is wanted. In the West, seed-drills have been perfected, but their cost is so high that their general use is not a practical proposition in this country at present.

Seed drills are in common use in black cotton soil areas, as the Deccan, Guntur, Nellore, Mysore and other places. Drills must have probably originated in these places on account of the dearth of labour. It may be interesting to note that in places where drill cultivation is in vogue, ryots do not maintain more than one pair of cattle for managing 20 to 40 acres. This fact is enough to prove that the drill is a labour saving implement.

The ryots use different drills for different crops, cholam drill for sowing cholam, cotton drill for drilling cotton, ragi drill for raising ragi etc. But each drill is provided with a seed-hopper with holes to suit the size of the seeds. Seed is dibbled generally by using the hand. All cannot do this work ensuring uniformity of seed distribution which depends on the dexterity of hand—a varying factor.

To obviate the necessity for keeping more than one hopper for sowing different crops the hopper described below has been designed:

This is fashioned after the wooden model but with this difference, the material is brass. It consists of two parts, the top half and the bottom half, the latter resting on the tubes. There are no side holes for fastening with ropes which is the case with the wooden hopper. Vertical pins are fixed instead. The hopper is provided with a number of small discs with holes suited to the size of the seed. By using discs suited to each kind of seed the same hopper can be used for sowing all kinds of seeds, such as ragi, tenai, cumbu, cholam, cotton, paddy, Bengal gram and bunch ground-nuts. This is not possible in the case of the wooden hopper.

The improved hopper is also fitted with a detachable seedbox provided with a stirrer*. Wherever the drills are found necessary the seed box and the stirrer supply a long felt want. The stirrer is provided with a cylindrical wooden piece with three longitudinal grooves for regulating the flow of the seed. Seeds drop when the groove is in a line with the hole of the hopper. No seed drops if there is no stirring. Gaps in sowing when handfuls of seed alternate do not occur by using this hopper. A movable disc is fitted on the top of the bottom half of the hopper; by turning the same clockwise or anticlockwise the holes can be closed or opened.

Counts taken of Bengal gram plants in two plots--one sown with this metal hopper provided with the stirrer and the other with the wooden hopper--have shown that the distribution of seeds is more uniform in the case of the metal hopper.

Particulars of a few trials made by using the metal hopper are given in the table below :

Name	Time taken to empty the seed box	Quantity of seed used in the box	Number of revolutions of the stirrer required to discharge the quantity	Calculated seed rate per acre	Remarks.
Cholam	10 minutes.	2 lb.	600	16.4 lb.	Figures calculated are based on the assumption that the rate of walking of work animals is at 2 miles per hour. The seed rate can be reduced or increased by lowering or increasing the number of revolutions per minute or by using discs with smaller or bigger holes.
Tenai	30 "	11.5 oz.	1832	2 "	
Ragi	30 "	9 "	1733	1.5 "	
Horse-gram	17 " & 20 seconds.	2 lb.	1175	9.5 "	
Bengal-gram	2 minutes & 10 seconds.	2 lb.	133	75 "	
Maize	1 minute & 5 seconds.	2 "	115	86 "	
Cotton	3 minutes & 20 seconds.	14 oz.	232	10.62 "	

* The writer is indebted to Mr. N. G. Charley, Research Engineer, Agricultural College, for the idea of the stirrer.—

The salient points of this hopper are :-

i. It is made of metal and therefore lasts long. It is always worth its weight of metal. It is elegant in design, fire proof and rat proof.

ii. The same hopper can be used for sowing all kinds of seeds only by changing discs. A continuous rope for fixing it on to the drill is not needed.

iii. The bottom half is provided with three projections which fit into the tin tubes, thus giving more stability. Tin tubes work better with this hopper.

iv. It is provided with a seed box and a stirrer which helps in the uniform distribution of seed.

v. There is a disc shutter to open or close the holes as necessity demands.

vi. If the stirrer gets out of order the hopper can be used like the wooden ones for sowing seeds with the hand.

My thanks are due to M. R. Ry., Rao Bahadur C. Tadulingam Avl., Principal and N. G. Charley, Esq., the Research Engineer and to Messrs. A. H. Subrahmanya Sarma and V. Viswanathan for help rendered in making trials.

THE ECONOMIC DANGER IN THE INTRODUCTION OF SOME FOREIGN ANIMALS AND PLANTS

BY T. V. RAMAKRISHNA AYYAR B.A., Ph. D., F. Z. S.,

(*Madras Agricultural Department.*)

Introduction. It is well known that, due to the action and reaction of various factors in nature, there is maintained what is called 'a balance of life' in this world. One of the most potent influences which helps to upset this even equilibrium, and bring about abnormal conditions in nature, is the part played by human agency. And, among the many such human activities, one has been the indiscriminate transportation of plants and animals from one country to another, without in the least realising or foreseeing the disadvantages and the often disastrous results of many such introductions. We have some examples of how man, without any evil intention, has been responsible for bringing about a very undesirable state of affairs in different regions of the world, by thoughtless introductions of different forms of life from one region into another. Though the geographical position of India is more or less isolated, situated as she is, clearly separated by natural boundaries of mountain walls or seas from other regions, in these days of quick and easy transport facilities for all sorts of animal and vegetable products not only by land and