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SEED PELLET

Marius H. Ostier, Mereville, France

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It has already been proposed to impart a pill shape, by means of a coating based on gypsum plaster, to beetroot seeds, particularly seeds having one germ only. Such pills, which are of a relatively small diameter, present inter alia the disadvantage that, notwithstanding the thinness of the coating, it prevents germination on account of its imperviousness to water and/or its resistance which the germ is unable to overcome, supposing it has been able to develop.

The main object of this invention is to provide a coating or artificial hull which is capable of fulfilling the three following conditions together:

(1) It is of a consistency which enables the seed to germinate without hindrance and at the proper time.

(2) It is sufficiently resistant not to be broken in the course of the various manipulations (coating, transport, placing in the sowing machine).

(3) It is proof against any variation of temperature and atmospheric moisture.

The coating or artificial hull according to this invention may comprise a base of inert material such as sand, sandstone, peat, loam or the like, and a binder such as a glue or adhesive based on starch serving to bind the inert material. Said inert base may be either in the natural state or crushed. The crushing of the base may be carried on down to any granular size, but it will obviously be continued so far and the crushed grains will be much smaller as it is desired to obtain pills of greater resistance or of smaller diameter, or as it is desired to use a smaller quantity of binding material.

Furthermore, the binder used to bind the grains of the base, instead of being a starch glue may also be any vegetable glue or other adhesive, such as paste, gluten and gelatine glues, provided it be imputrescible and capable of swelling under the influence of and being permeated through by water. A carbohydrate glue such as starch, paste or gluten glue is particularly desirable. In fact, it is important that, when the pill is deposited in a sufficiently moist soil, the coated seed should be subjected to the action of moisture from the ground to bring the germination about, and that, owing to that moisture, the coating should lose enough of its resistance to enable the germ to overcome it and develop normally in the soil.

The glue or adhesive used as a binder may be rendered imputrescible by any known process and it may be applied in a form other than powder, and in particular be made to swell or be diluted in a suitable solvent, such as water, for instance.

By way of example, the invention may be carried out as hereunder.

A paste is made composed as follows:

(a) 1 kg. of fine sand, such as quarry sand.

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(b) A liquid glue or adhesive produced by diluting in the cold state in 200 ccs. of water, 10 grams of glue in powder or flakes with a starch base as sold commercially under the name of "glue 300." The liquid glue so produced is poured into a vessel containing the sand and these ingredients are stirred together so as to produce a homogeneous paste.

Said paste is then used in the manner known in the manufacture of pills in order to coat the seeds, and the pills are, of course, dried before use.

The pills may be of any diameter. Tests have shown that even with an excessive diameter such as 4 cm., for instance where the seeds are monogerm beetroot seeds, the germination is not prevented. The preferred diameter for the pills is about 8 mm. It is also possible, whilst the paste is being prepared, to incorporate any insecticide or other suitable material with the paste, for example in order to promote germination, or the finished pill may also be coated with a further layer of said insecticide or material.

The invention also relates to calibrated pills in which the coating presents a certain elasticity, whilst remaining capable of becoming disaggregated or softened when in contact with water, so that the seed may both have the advantage of moisture favourable to its germination and develop its germ through the coating or its fragments after the pill has been put in the ground. Due to such elasticity the pills are much more resistant to shocks, especially when they are packed, handled or transported and particularly when they are placed in the sowing machine itself.

Another object of the invention is to produce "stratified" coatings, namely coatings in which each constituent is distributed in a coat surrounding either the seed itself or a previous coat. A further object is to produce seeds covered over with coating films of a thickness variable as desired, including very thin films, or with films having specific gravities which can be controlled at will in the process of production, whereby it is possible, inter alia, finally to obtain pills which when they are sown are not affected by wind to an appreciable degree.

According to that aspect of the invention, the coating comprises a natural or artificial, resilient material which is inert towards the seed or at least does not attack the seed. Such resilient material can, in principle, be applied as a layer, if it is sufficiently fluid or if it has been fluidised, but more generally, a solid material is resorted to, which is then preferably applied in a granular or powdery state as, for instance in the form of sifted, rasped, ground or crushed material. As

an example of natural materials, there may be mentioned in the first place cork, which offers the advantage that it can be obtained very easily and at a very low price and that it possesses a great elasticity, even in minute particles. There may also be mentioned other ligneous or cellulosic materials such as ground straw, refuse of elastic textiles, crushed peanut hulls, sawdust, and the like. As an example of artificial and natural materials which are not cellulosic and not ligneous there may be mentioned elastomers and particularly elastoprenes (rubbers and related substances) which are endowed with sufficient elasticity. Natural materials of mineral origin such as asbestos may also be used. In this connection all natural or artificial materials available as a resilient fiber padding may be resorted to. In principle, it is not necessary, although in many cases it is advantageous, to introduce also a dense ingredient in the coating composition for the purpose of giving weight to the finished pills.

According to the invention, the constituents of the coating compositions may also be applied either individually or in groups and in rotation, by suitably measured amounts, in the form of a spray or shower of minute particles upon the seeds subjected to a continuous stirring motion, as produced, for instance, in spherical containers in the production of sugar coated pills. For that purpose, a binder, preferably starch glue, is first sprayed in and, as the case may be, further binder material is again sprayed in after several other constituents have been sprayed in.

For example, if the binder is the only liquid constituent, said liquid is sprayed in the form of a sprinkle or a fine spray alternately with the dusting in of the other ingredients.

The application of the above methods will be illustrated by the following example which relates to the coating of beetroot seeds previously split up so as to form seeds having one germ only, and to the use of cork as resilient material.

Example

In a spherical container such as those used in making sugar-coated pills, I place 3 kilos of monogerm seeds, the container rotating at a rate of about 25 revolutions a minute.

A tacky liquid consisting of one litre of water to which had been added 20 grams of gluten glue sold on the market under the name of N L T glue was sprinkled on said seeds. As soon as the seeds appeared to be on the point of becoming agglomerated, that is to say when 300 ccs. of liquid had been atomised, the whole mixture was sprinkled with 250 grams of fine sand ("Fontainebleau" sand). Such sand adhered to the glue coated seeds and isolated them from one another.

The same operation (atomising and powdering) was continued until 2.750 kilos of sand had become "glued" to the seeds.

The coated seeds were removed from the container then sifted through a sieve with circular meshes of 3.75 mm. The seeds which passed through the meshes were put back in the spherical container in which a binder and then sand as before were sprayed in until all the seeds could be retained by the sieve.

All the seeds were then placed in a larger spherical container in which alternately 300 ccs. of water glued as before were atomised and 40 g. of cork flour were sprinkled. This operation was repeated several times until the balls thus formed were retained by a 5 mm. mesh screen, whilst the smaller ones were returned to the container to be coated again as in the case of the sanding operation.

The balls formed in this way are dried, for example in a hot air rotary drier, the temperature of the air not being allowed to exceed 80°, so as not to destroy the germinative capability of the seeds. The balls when finished are of a diameter varying between 4 and 5 mm. where the seeds are monogerm beetroot seeds.

The object of the "sanding" operation is to add weight to the balls so as to allow a more uniform sowing. In the case of certain seeds other than beetroot seeds and also in the case of certain sowing machine, such operation is not necessary.

Coating with cork or like resilient material imparts to the seed a resiliently flexible film which facilitates transport without any special packing. Moreover, a film having thickness as low as a few tenths of a millimeter although being quite adhesive can be put on the seeds. In any case the seed retains all its germinative vigour.

As above stated, the coating may contain inside and/or on the surface thereof, adjuvants such as fertilisers and other growth stimulating products.

While for the sake of convenience, reference has been made to beetroot seeds, this invention is not restricted to beetroot seeds as will readily be realized. It has been found in particular that very good results were obtained in coating cotton seeds with their fibers, with films of the type above described, particularly films containing powdery cork or like resilient material; it is desirable to incorporate an anticryptogamic or seed dressing substance such as an organic mercury compound, in the coating, at least in a final film around an underlying film which contains powdery cork or the like. Coated cotton seeds having an average diameter of about 1 to 2 centimeters were found convenient for use.

What I claim is:

1. A seed pellet which comprises a seed encased in a body of a water-permeable binder adapted to be swollen by water, said body containing particles of cork disseminated at least in its outer portion.

2. A seed pellet which comprises a seed encased in a coating of fine cork particles and a starch glue holding said cork particles together.

3. A seed pellet which comprises a seed encased in a coating comprising a water-permeable binder adapted to be swollen by water, particles of an inert material of higher specific gravity than the remainder of the coating, disseminated in said binder in the inner portion of said coating, and cork particles disseminated in said binder, in the outer portion of said coating.

4. The seed pellet of claim 3, said inert material being sand distributed in a substantially spherical inner layer of said binder, while cork particles are distributed in a substantially spherical outer layer of said binder.

MARIUS H. OSTIER.

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