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(54) Exposing seeds & c to a magnetic field

(57) Seeds, bulbs or seedlings are exposed to a magnetic field for at least 5 minutes. The magnetic field may be up to 10,000 times greater than that of the earth. It may be produced by a permanent magnet or an electromagnet. The plant material may be sterilised, rinsed and dried before exposure to a magnetic field. Kidney or soy beans may be treated.

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SPECIFICATION

Method for treating plant material to enhance growth properties

The present invention relates to methods of treating plant material, such as seeds (including artificial and genetically engineered seeds), bulbs, and/or seedlings, to enhance its growing properties.

It is well known to provide seeds etc. with a warm environment, e.g. a greenhouse, and/or with plentiful water. Such methods may increase growth but they have their disadvantages. The resulting plants may be weak, have poor survival rates, and/or show poor reproductive behaviour (flowering etc).

It is therefore desirable to find a new method of plant husbandry, which can improve the growth and preferably also the reproductive behaviour of the plants.

Plant material is composed principally of the six elements C,H,O,N,P and S, with significant amounts of alkaline earth metals such as magnesium (Mg) and calcium (Ca). It also contains trace elements, such as Fe,Mn,Cu,Zn,Mo and B. The trace elements, and iron (Fe) in particular, are very important in the growth of plants, notably in the germination of seeds. They are usually complexed to organic components, e.g. to form an oxygen activator which directs oxygen transport for metabolism. Chelated trace metals are also involved in absorption, and directing migration and morphogenic accumulation of various nutrients within the plant. They also serve to maintain the higher order structure of the organism.

Iron is incorporated throughout the cormophyte and is preferentially found in the meristematic tissue of terminal and lateral buds and developing young leaves. In various iron-containing proteins, such as haems, it plays an important part in physiological processes such as respiration and chlorophyll synthesis. The importance of iron is shown by the possible consequences of an iron deficiency: decline in iron proteins leading to reductions in metabolism, respiration, photosynthesis and the nitrate reducing power of the cell; and possibly to cessation of cell division.

According to the present invention there is provided a method for treating plant material to enhance its growing properties which comprises exposing the material to a magnetic field.

Of course the field should generally be substantially greater than that of the earth, suitably at least one or more orders of magnitude greater (i.e. at least 10, more preferably at least 100, possibly at least 1000 or 10,000 times greater). The treatment seems to 'activate' the iron within the plant material. This may be effected using a permanent magnet or an electromagnet. Particularly preferred is the use of a powerful electromagnet as is normally used for making permanent magnets.

Activation can cause enhanced growth and/or enhanced reproduction. It can enhance migration of iron (and iron-containing substances) in the material.

The material may be exposed to a field for several minutes, e.g. at least 5.

Embodiments of the invention will now be given by way of example only.

Example 1

Kidney beans (var. 'Kurokintoki') were grown from seeds sown on 15th September in a greenhouse with the room and soil temperatures maintained at 20°C. One portion of the seeds were first treated with a magnet ('KIDNEY: magnetised') while the remainder were not ('KIDNEY: control'). The magnet treatment involved: sterilisation with 1000-fold ('ursprung') liquid for 30 minutes, then water, followed by drying (desiccation) and magnetic treatment by being placed on a plated electromagnet, for about 10 minutes.

The results are given in the table.

Example 2

Green soybeans (var. 'Kosodefuri') were similarly grown in a greenhouse at 25°C, generally as in Example 1, and the results are also given in the table. The seeds were planted on 25th August.

TABLE

Seeds	Germination period (days)	Days till harvest	Flower production (per stock)	Harvested legumes (per stock)
KIDNEY: control	5	52	38	9
KIDNEY: magnetised	4	40	57	18
SOYBEAN: control	11	82	76	21
SOYBEAN: magmetised	9	70	87	28

These results clearly show that the treated seeds have been 'activated', leading to significant increases in growth and reproductivity (crop).

Several other types of plant were similarly investigated. It was found that the magnetic activation can improve the freshness of plants, and the keeping qualities of harvested material. From the mid-phase of cultivation, the arbour vivacity flourishes. Even with low temperature, as in the cold season, and/or with much rain and a wet soil, development of

pistallate flowers and the pollen volume of staminate flowers are excellent, with abundant production thereof, without significant loss of seeds after pollution. Compared with untreated seeds, growth is accelerated.

As a result, foliar (leaf) vegetables which normally require 6 months cultivation time during the winter period could be harvested after approximately 5 months cultivation time.

For flowering plants, treated seeds gave higher plants with flowers whose petals were markedly larger and the colour more vivid than for control plants.

CLAIMS

1. A method for treating plant material to enhance its growing properties which comprises exposing the material to a magnetic field.

2. A method according to claim 1 wherein the plant material is sterilised, before being exposed to a magnetic field.

3. A method according to claim 2 wherein the sterilised material is rinsed and dried prior to magnetic treatment.

4. A method according to any preceding claim wherein the plant material comprises seeds and/or bulbs and/or seedlings.

5. A method according to any of claims 1 to 3 wherein the plant material comprises seeds.

6. A method according to any preceding claim wherein the plant material is material of a leguminous plant.

7. A method according to claim 6 wherein the plant material is beans.

8. A method according to any of claims 1 to 5 wherein the plant material is material of a foliar vegetable.

9. A method according to any preceding claim wherein the material is exposed to the magnetic field for at least 5 minutes.

10. A method for treating plant material by exposure to a magnetic field substantially as any herein described and exemplified.

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