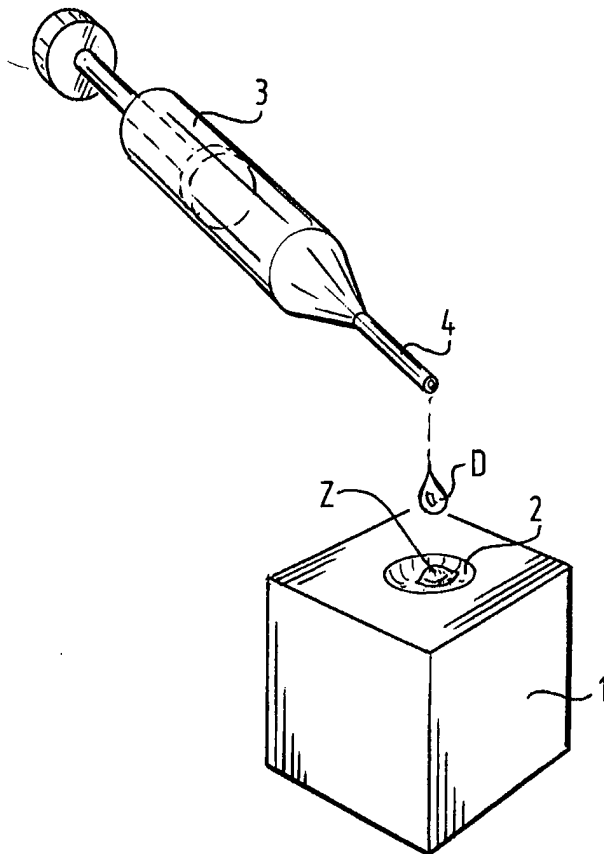




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(21) International Application Number: PCT/NL97/00687 (22) International Filing Date: 12 December 1997 (12.12.97) (30) Priority Data: 1004759 12 December 1996 (12.12.96) NL (71) Applicant (for all designated States except US): PLANTENKWEKERIJ G.N.M. GROOTSCHOLTEN B.V. [NL/NL]; Geestweg 146a, NL-2671 MC Naaldwijk (NL). (72) Inventor; and (75) Inventor/Applicant (for US only): MULDER, Jan [NL/NL]; Oleander 37, NL-2671 NP Naaldwijk (NL). (74) Agent: HOORWEG, Petrus, Nicolaas; Arnold & Siedsma, Sweelinckplein 1, NL-2517 GK The Hague (NL).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: METHOD FOR CULTIVATING A PLANT USING A CULTURE BLOCK, CULTURE BLOCK AND APPARATUS FOR HANDLING SUCH BLOCKS		
(57) Abstract A method for cultivating a plant, starting from seed or a vegetatively reproduced starting material, wherein use is made of a block (1) with a positioning site (2) on the upper surface for placing of the seed (Z), and wherein a quantity of liquid with plant-protecting properties is placed on the positioning site (2), whereby the plant is still effectively protected without danger to the surrounding area.		



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**METHOD FOR CULTIVATING A PLANT USING A CULTURE BLOCK,
CULTURE BLOCK AND APPARATUS FOR HANDLING SUCH BLOCKS**

The invention relates to method for cultivating a plant, starting from seed or a vegetatively reproduced starting material, wherein use is made of a block with a positioning site on the upper surface for placing of a
5 seed.

It is usual to germinate the seed on the positioning site, for instance a cavity of the culture block, and subsequently cause the plant to grow further to a determined size, whereafter the block with plant is further
10 cultivated on a following substrate.

It is usual herein to protect the plant for germinating against diseases and fungi, for which purpose a number of options have developed in practice. It is possible to provide the plant with a coating, which
15 coating contains a plant-protecting agent. During growth this agent is absorbed into the root system and plant material so that the plant becomes resistant.

It is also possible to spray the germinating plants with the plant-protecting agent, and it is finally possible to mix the material from which the substrate block is
20 manufactured with plant-protecting agents before the material is pressed into a culture block. The drawback to such methods is that the coated seeds are relatively expensive and, due to the hygroscopic action of the
25 coating, can easily become adhered to each other. This has an adverse effect on the sequential automatic feed of the seeds onto the successive culture blocks. Coating of the seeds in many cases limits the storage life or life-span of the seeds and can also have a negative effect on
30 the germinative power in the short term. The spraying method is dangerous for the surroundings and particularly for the person who must cultivate the plants. Mixing of the material of the block results in an excess quantity of the plant-protecting agent, which is likewise expensive and requires measures for handling of the blocks.
35

The invention has for its object to obviate the above stated drawbacks and provides to this end a method which is distinguished in that a quantity of liquid with plant-protecting properties is placed on the positioning
5 site.

The same favourable effect of the coated seed is achieved by administering plant-protecting agent according to the invention in the direct vicinity of or on the seed at the positioning site of the culture block. It is
10 now possible however to suffice with "uncoated" seed, so that the above stated drawbacks of mutual adhesion do not occur. Seed can moreover be purchased comparatively cheaply.

Only a small quantity of a plant-protecting agent
15 need be introduced at the location where the seed comes to lie for the substance to nevertheless be absorbed into the root system.

Since the substrate remains completely free of the plant-protecting agent on the outside, the usual manual
20 work on the culture blocks can be carried out normally without any danger to the grower.

The invention further proposes to apply the substance to the positioning site prior to placing of the seed. This can take place according to the invention in
25 droplet form, or otherwise by spraying the material if it is in the liquid phase. It is also possible to apply the substance in powder form to the positioning site of the block.

The invention further relates to a culture block for
30 cultivating a plant starting from seed, which block is provided with a positioning site, for instance a recessed portion on the upper surface thereof, which is provided using the above stated method with a plant-protecting agent.

35 The invention further also to an apparatus for handling culture blocks provided with a frame, a conveyor supported by the frame, a device deployed along the conveyor for placing a seed grain on the positioning site, such as a recessed portion of the block, and a feed
40 member for covering the positioning site and the seed

with a covering means, wherein between the device and the feed member is arranged a feed nozzle for the protective substance which debouches above the conveyor for the blocks.

5 The invention will be further elucidated hereinbelow with reference to two embodiments of the method with a culture block provided with an upper surface with recessed portion as positioning site.

10 Fig. 1 and 2 each show a perspective view of a culture block which undergoes a method according to the invention in two different, schematically shown ways.

15 Designated with the numeral 1 is the culture block which is substantially rectangular and can be manufactured from random material. Use is made here for instance of rockwool, peat, agrofoam, perlite and so on.

20 The block is embodied here in the upper surface with a recessed portion 2 which can be cup-shaped, reverse conical or of other suitable form. It may however only be a positioning site of little or no depth. In the deepest part thereof a seed grain Z will normally come to lie after having been arranged in random manner, i.e. manually or via a mechanical feed device. A quantity of liquid can subsequently be applied dropwise to the seed grain itself by a liquid supply device 3.

25 Liquid supply device 3 is shown here as a cylinder with hand-operated piston and discharge tube 4 for supplying the droplet D. This is of course a schematic view of any random supply device, which may likewise be a part of the seed feed device.

30 Fig. 2 shows a block corresponding with fig. 1, wherein however the liquid supply device 3' is embodied such that an atomizing of the liquid from the spray nozzle 4 takes place. The seed feed device 5 can subsequently supply a seed Z to the mist sprayed recessed portion 2 of block 1, in which method seed Z is itself not therefore covered by the mist spray.

40 It is also possible with feed device 3 to supply plant-protecting material not in the form of liquid but as powder and to arrange it in the recessed portion 2 of block 1.

The invention is not limited to the above described examples. It is noted that the seed can also be replaced by vegetatively reproduced starting material, for instance cuttings, tissue culture plants or artificial
5 seed. This latter consists of plant cells which are placed "in solution" and which can then be "sown" as individual cell with or without coating.

CLAIMS

1. Method for cultivating a plant, starting from seed or a vegetatively reproduced starting material, wherein use is made of a block with a positioning site on the upper surface for placing of the seed, **characterized**
5 **in that** a quantity of liquid with plant-protecting properties is placed on the positioning site.

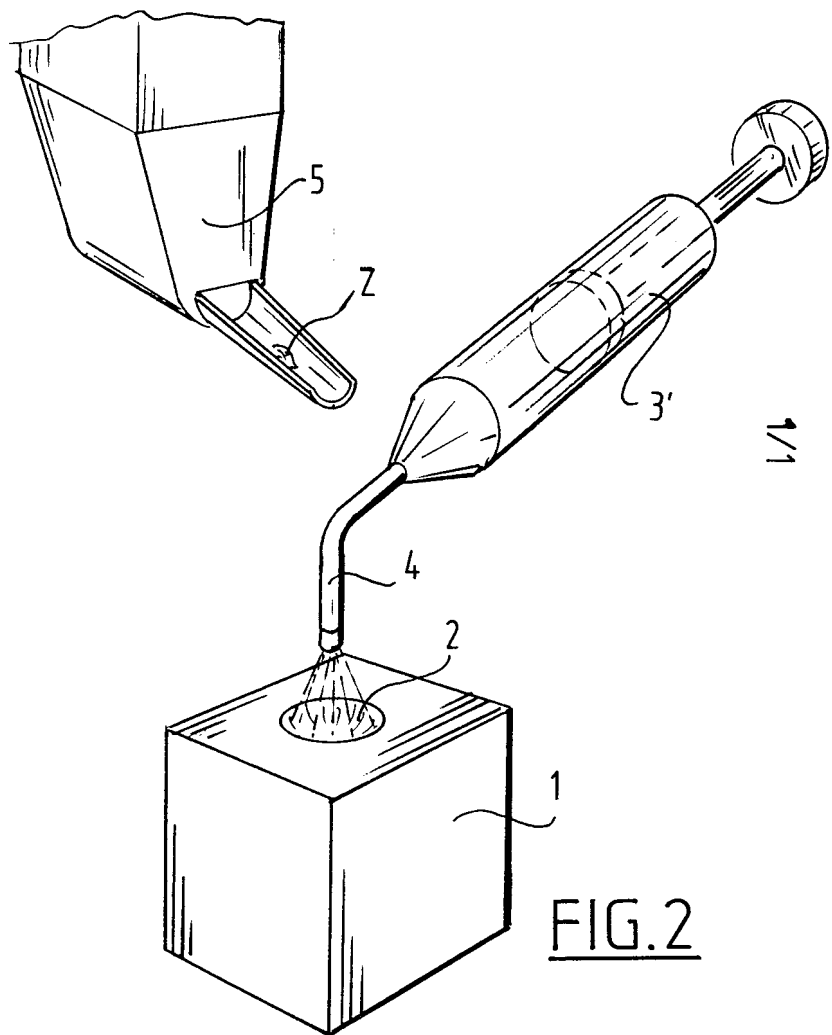
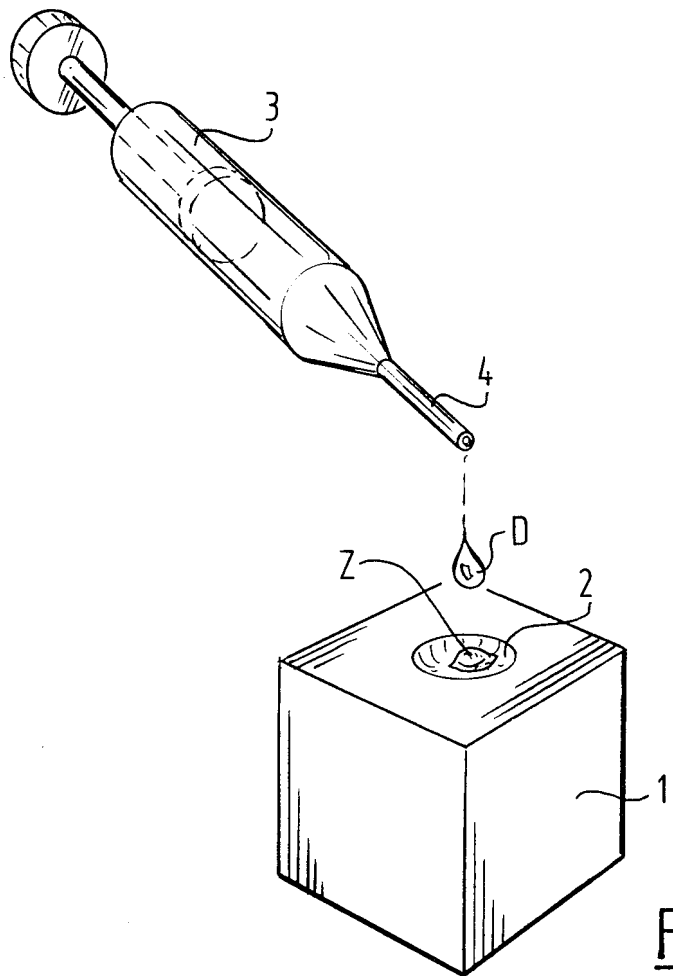
2. Method as claimed in claim 1, **characterized in that** the substance is introduced onto the positioning site prior to placing of the seed.

10 3. Method as claimed in claim 1, **characterized in that** the liquid is poured onto the positioning site in droplet form.

4. Method as claimed in claim 1, **characterized in that** the liquid is sprayed onto the positioning site.

15 5. Culture block for cultivating a plant, starting from seed or a vegetatively reproduced starting material, and provided with a positioning site on the upper surface thereof which is provided with a plant-protecting agent using the method as claimed in claim 1.

20 6. Apparatus for handling culture blocks as claimed in claim 5, provided with a frame, a conveyor supported by the frame, a device deployed along the conveyor for placing a seed grain on the positioning site of the block, and a feed member for covering the positioning
25 site with a covering means, **characterized in that** between the device and the feed member is arranged a feed nozzle for the protective substance which debouches above the conveyor for the blocks.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 97/00687

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A01C1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A01C A01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 38 44 418 A (SUGAWARA) 30 November 1989 see the whole document	1,2,4,5
Y	----	6
Y	US 5 247 761 A (MILES ET AL.) 28 September 1993 see column 6, line 44 - line 58; figures 1,4	6
A	----	1,4
A	FR 2 164 010 A (ZORRA) 27 July 1973 see page 3, line 4 - line 11; figures	1,5
A	DE 39 25 933 A (JOCHIMS ET AL.) 7 February 1991 see the whole document ----- -/--	1,4

☒ Further documents are listed in the continuation of box C.

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0 389 355 A (ISOVER SAINT-GOBAIN) 26 September 1990 see column 4, line 34 - line 48; figures ---	1,4
A	WO 94 16549 A (ROCKWOOL/GRODAN) 4 August 1994 -----	

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