

European Patent Office
PB 5818 – Patentlaan 2
NL-2280 HV Rijswijk
The Netherlands

Attn.: Davies Maxwell

Sint-Martens-Latem, January 19, 2023

Our ref.: BIPA-008-PCT
Re.: International patent application PCT/EP2022/057720 filed on March 24, 2022
“Methods for improving rice yield and treating blast disease, sheath blight disease,
or a combination thereof on a rice plant”
In the name of BIPA NV

Dear Madam, Dear Sir,

Further to the Written Opinion of the International Preliminary Examining Authority (IPEA) dated November 30, 2022 issued by the European Patent Office in respect of the above-referenced patent application, please find enclosed an amended set of claims and the response of the Applicant.

Claim amendments

The claim amendments are detailed in a marked-up claim set enclosed herewith. Reference is made to the claims and the description of the International application as filed.

Claim 1 has been amended by incorporating the subject-matter of former claim 11: “wherein the application of choline pelargonate or the composition to the rice plant, part thereof, or locus of growth of the rice plant is performed after the manifestation of symptoms of blast disease, sheath blight, or combination thereof on the rice plant or part thereof”.

Claim 10 relating to application before the manifestation of symptoms has been deleted, and the remaining claims have been renumbered accordingly.

Claim 11 has been amended by deleting the subject-matter which has been made the subject of claim 1, and by deleting the wording “such as”.

Claim 14 has been amended to recite “Use of choline pelargonate or a composition comprising choline pelargonate for increasing the rice yield of a rice plant relative to the rice yield of an untreated rice plant, wherein choline pelargonate or the composition is applied to the rice plant, part thereof, or locus of growth of the rice plant after the manifestation of symptoms of blast

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disease, sheath blight, or combination thereof on the rice plant or part thereof. Basis for the amendment can be found in former claim 15, and on p. 15, l. 23-26 and 29-31 of the application as filed.

Claim 15 (former claim 16) has been amended by incorporating the subject-matter of former claim 26: “wherein the application of choline pelargonate or the composition to the rice plant, part thereof, or locus of growth of the rice plant is performed after the manifestation of symptoms of blast disease, sheath blight, or combination thereof on the rice plant or part thereof”.

Claim 25 relating to application before the manifestation of symptoms has been deleted, and the remaining claims have been renumbered accordingly.

Claim 24 (former claim 26) has been amended by deleting the subject-matter which has been made the subject of claim 15, and by deleting the wording “such as”.

Claim 28 has been amended to recite “Use of choline pelargonate or a composition comprising choline pelargonate in the ~~prevention or~~ control of blast disease, sheath blight, or combination thereof on a rice plant or part thereof, wherein choline pelargonate or the composition is applied to the rice plant, part thereof, or locus of growth of the rice plant after the manifestation of symptoms of the blast disease, sheath blight, or combination thereof on the rice plant or part thereof”. Basis for the amendment can be found in former claim 30, and on p. 15, l. 23-26 and 29-31 of the application.

It is respectfully submitted that the amendments do not introduce subject-matter which extends beyond the content of the application as filed.

Response to item V of the written opinion – Novelty

Without acquiescence to the objections made to the claims, claim 1 has been amended by incorporating the subject-matter of former claim 11, and claim 15 (former claim 16) has been amended by incorporating the subject-matter of former claim 26.

The written opinion states that “Document D1 does not disclose all of the features in combination of the subject matter of claims 2, 9-13, 17, and 24-28. These claims are considered as being new”. The Applicant welcomes this statement, which continues to apply to present independent claims 1 and 15.

Use claims 14 and 28 have been amended accordingly and hence, the subject-matter of claims 14 and 28 is also novel over the cited prior art.

In view thereof, the subject-matter of claims 1-28 is novel over the cited prior art.

Response to item V of the written opinion – Inventive step

Regarding the inventive step, D1 is considered as the closest prior art document. D1 provides a method for preventing or controlling a fungal infection on a plant or plant part, the method comprising applying a composition comprising a choline salt of a C8-C10 fatty acid, in particular choline pelargonate, to the plant, plant part, or locus of growth of the plant (D1, claims 10 and 15).

The difference between claim 1 and D1 is at least that the application of choline pelargonate or a composition comprising choline pelargonate to the rice plant, part thereof, or locus of growth of the rice plant is performed after the manifestation of symptoms of blast disease, sheath blight, or combination thereof on the rice plant or part thereof.

The effect of this difference is that choline pelargonate or the composition provides a complete stop-effect on the development of blast disease and sheath blight on rice plants upon curative treatment (p. 3, l. 17-23 of the PCT application).

The technical problem can thus be formulated as the provision of a fungicide or fungicidal composition providing a complete stop-effect on the development of blast disease and sheath blight on rice plants upon curative treatment.

By extensive experimental testing, the inventors have unexpectedly found that choline pelargonate (e.g. at concentrations causing no phytotoxicity) provides a complete stop-effect on the development of blast disease and sheath blight on rice plants upon curative treatment (p. 3, l. 17-23 of the application). For instance, Examples 1-3 of the PCT application illustrate the effect on the development of blast disease and sheath blight on rice plants when application of choline pelargonate is performed after the manifestation of symptoms on the rice plant, in particular with first application:

- when at each plot symptoms began to appear with an intensity that is less than 5%: Example 1, blast disease, see Table 3, treatment numbers 7-9; Example 2, sheath blight disease, see Table 7, treatment numbers 7-9;
- when a symptom of the disease was found: Example 3, sheath blight disease, see Table 11, treatment numbers 1-3, and Table 12 (75 days after sowing at location L1 Bang Kham) or Table 14 (70 days after sowing at location L2 Don Pru).

The results show that the curative application of a composition comprising choline pelargonate provided satisfactory treatment of blast disease on rice plants compared to untreated plants (i.e. significantly less intensity of blast disease and better efficacy, see Tables 4 and 5) and significantly better average rice yield (see Table 6). Further, the results illustrate that the curative application of a composition comprising choline pelargonate provided satisfactory treatment of sheath blight on rice plants compared to untreated plants (i.e. significantly less intensity of sheath blight and better efficacy, see Tables 8 and 9) and significantly better average rice yield

(see Table 10). The results in Tables 13 and 15 show that the composition illustrating the invention ("BPA 056") at 3000 and 4000 ml/ha showed excellent control against sheath blight on rice plants as compared to untreated rice plants. The composition illustrating the invention at 2000 ml/ha also showed acceptable control against sheath blight on rice plants. Further, the results show that the composition illustrating the invention ("BPA 056") at 4000 ml/ha provided excellent rice yield as compared to untreated rice plants, the compositions illustrating the invention ("BPA 056") at 2000 and 3000 ml/ha still showed high rice yield as compared to untreated rice plants (Table 16).

The finding of the stop-effect on the development of blast disease and sheath blight on rice plants after the manifestation of symptoms of the disease is surprising given that pelargonic acid typically is known to function as a **contact** (i.e. non-systemic) herbicide (see, e.g. D1, p. 1, l. 22-26). Choline pelargonate would thus **not be expected** to function as a **fungicide for curative disease control** (p. 3, l. l. 17-23 of the application). The application of choline pelargonate after the manifestation of the symptoms on the rice plant advantageously allows for treatment of the blast disease, sheath blight, or combination thereof after onset of the disease when preventive treatment would no longer be possible.

D1 does not provide any suggestion about the application of choline pelargonate **after the manifestation of symptoms** of blast disease, sheath blight, or combination thereof on the rice plant or part thereof. In D1, choline pelargonate was used as a contact fungicide when applied on plants. For instance, Example 3 of D1 provides the evaluation of the use of a composition comprising choline pelargonate as a fungicide (in vivo). Single leaf test with powdery mildew (*Podosphaera xanthii*) was performed. A zucchini plant was selected with a powdery mildew infection on old leaves. In addition to a leaf showing the first signs of infection of powdery mildew (leaf N-1), two leaves without infection (leaf N and N+1) were selected. Only leaf N without infection was sprayed with a solution of 0.8% choline pelargonate in water until just before run-off. Leaf (N+1) without infection and leaf (N-1) showing the first signs of infection of powdery mildew were left **untreated**. The fungal infection was assessed 8 days after the treatment (D1, p. 22, l. 3-13). Hence, D1 only provides a suggestion to use choline pelargonate for preventive treatment and is entirely silent on its use for curative disease control.

The solution is also not found in D2 (WO 03/059063). D2 relates to agricultural compositions that find particular use as a fungicide composition. The fungicide composition can include one or more fatty acids and one or more organic acids different from the fatty acid (D2, abstract). The fatty acid may be selected from the group consisting of: pentanoic, hexanoic, heptanoic acid, octanoic acid (i.e. caprylic acid), pelargonic acid, decanoic acid (i.e. capric acid), undecanoic acid, lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid, linolenic acid, linoleic acid, erucic acid, palmitoleic acid, pentadecanoic acid, margaric acid, arachidic acid, arachidonic acid, behenic acid, mixtures thereof (D2, claim 3). D2 does not provide any suggestion about the application of choline pelargonate, let alone the application of choline pelargonate to a rice plant, part thereof, or locus of growth of the rice plant after the manifestation of symptoms of

the blast disease, sheath blight, or combination thereof on the rice plant or part thereof. Therefore, D2 does not provide any suggestion about the present invention.

Furthermore, similar arguments apply to independent method claim 15, and use claims 14 and 28.

In view thereof, the subject-matter of claims 1-28 involves an inventive step over the cited prior art.

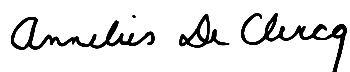
Requests

The Applicant submits that the claims fulfil the requirements of the PCT, and a notion thereto is respectfully requested.

All amendments were made without prejudice to the possibility of future reinstatement of any excluded matter. Any amendments made by way of the present letter, and the observations contained herein, are made solely for the purposes of the international preliminary examination of this international application and without prejudice to the Applicant in national/regional jurisdictions.

Should the Examiner not agree, a telephone interview with the Undersigned is requested. The Applicant is of the opinion that such an interview would greatly assist in the understanding of the invention.

Respectfully submitted,



Mrs. De Clercq, Annelies
Professional Representative before the EPO