AdvisoryNetPEST

Agro ECA Protect: 4 actions in 1 product biostimulant for berry fruit



Crop Sector
Berry fruit

Country
Poland

Description of the context

Berry growers face more frequent heat waves (>30 °C), long wet spells favouring grey mould and anthracnose, soil-borne pathogens arriving with nursery plants, fewer authorised fungicides and retailer demand for residue-free fruit.

Partner Organization

Agro Smart Lab sp. z o.o. (Koniusza, PL) with manufacturer Bio ActiW sp. z o.o.

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AdvisoryNetPEST

The **AdvisoryNetPEST** project aims to create a **network** and **upgrade advisory services** across the EU to increase the sharing of knowledge and the **adoption of innovative solutions to reduce the use and risks of pesticides** (RURP) in all **EU Member States**, enabling the agricultural sector to achieve the targets proposed by the Farm to Fork Strategy.

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THE TECHNIQUE

Short Description:

Agro ECA Protect is based on hypochlorous acid (HOCl), a natural compound produced by our white blood cells to kill viruses, bacteria and fungi. Made by electrolysis of salt and water, it gives plants the same kind of residue-free defence against pathogens.

Type of novel approach:

Non-microbial plant biostimulant under EU Reg. 2019/1009 (PFC 6(B), CE 1434); approved for organic farming (PL/SE/81/2022); patent PL 244920.

Not a plant protection product.

Targeted pest and diseases:

Control of fungal and bacterial diseases affecting leaves, flowers and fruit: grey mould (Botrytis cinerea), anthracnose (Colletotrichum), powdery mildew, Pseudomonas syringae, Xanthomonas.

Reduced risk of soil-borne fungal diseases: Pestalotiopsis, Fusarium, Phytophthora.

Objective of the Novel Approach:

Replace fungicides in the harvest window with a residue-free, zero-PHI, bee-safe treatment.

Its unique ability to open stomata stimulates growth and reduces heat- and humidity-stress damage by cooling plants, maintaining gas exchange and boosting photosynthesis.

Level of practice adoption across the country:

1 2 3 4 **Estimated: 4**

1 (few farms) to 4 (widely used)

Date: 22/11/2026

Funded by the European Union

UK Research and Innovation

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Expectations regarding RURP*

- A growing number of growers of strawberries, field and greenhouse cucumbers and tomatoes in Poland, and increasingly in the Czech Republic and Austria, are replacing fungicides with Agro ECA Protect during the harvest period, gaining better fruit quality, longer shelf life and residue-free produce.

Key success factors

- Dual mode of action: electrolysed water containing hypochlorous acid (HOCl) kills fungi and bacteria and also forces stomata to open, which stimulates growth and reduces the negative effects of abiotic stress.
- Timing: spray in the evening or early morning, never in full sun during the day, within 1–2 days after rain or a DSS infection alert (Farm Smart Alert). Never spray before rain, as there is no rain-fast preventive effect. During prolonged rainy periods, repeat every 2–3 days.
- Moist root zone: the stomatal effect needs water; plan ~20% more irrigation.
- Water and mixing: pH ≤ 7.5 (no ammonium acidifiers); no tank mixes, other inputs 1–2 days later.

Methods/strategy of application

Intervention (stops infection before symptoms appear): 2.5% solution, 7.5–15 litres of product per hectare, applied 1–2 days after rain; repeat every 2–3 days during prolonged rain.

Curative (limits the spread of visible disease): 4% solution as soon as symptoms appear, followed by a 2.5% spray after 2–3 days.

Tunnels (protection under cover, where humidity is high): spray once or twice a week, or fog with a 15–20% solution at 60–120 litres per hectare, which adds much less moisture than spraying.

Heat (keeps plants cool and growing during heat waves): 2.5–4% solution, applied 6–18 hours before temperatures rise above 30 °C.

Plug plants (eliminates soil-borne pathogens inside the young plants): drench with a 4% solution on 2–3 consecutive sunny mornings, when roots actively take up the product.

Frost and hail (disinfects wounds and speeds up healing): 2.5% solution within 24–48 hours after the event.

Improvements of the Novel Approach

Decision support system (DSS): infection-risk models and vapour pressure deficit (VPD) monitoring, e.g. Farm Smart Alert, signal when treatment is really needed. This reduces the number of sprays and ensures they are applied at the moment of infection. Farm Smart Alert does not require installing a weather station on the farm.

Fogging under cover: uses 10–20 times less water than spraying, so it does not raise humidity in tunnels and greenhouses, which would favour diseases.

Drone application: a 5% solution at 100 litres per hectare allows fast treatment of large or wet fields where tractors cannot enter.

Resources and skills needed to adopt the Novel Approach

Timing treatments by infection risk: reading alerts and spraying after rain, not before.

Correct dilution and water pH control: keeping pH at or below 7.5 so the active substance stays effective.

Irrigation management: keeping the root zone moist so stomata can open.



Fig. 1: Spraying plug plants (nursery)



Fig. 2: Cold fogging in a tunnel

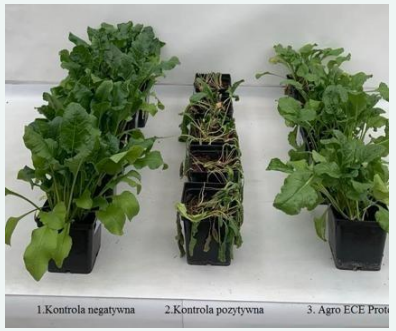


Fig. 3: Heat test, 35 °C

Advice from the Field

- **Field strawberry, grey mould and anthracnose (confirmed by hundreds of growers): Intervention (stops infection before symptoms appear) with a 2.5% after each rain. When symptoms appear, use 4% solution.**
- **Tunnel strawberry in coconut substrate (Amplus 8.5 ha, R. Batolik 0.5 ha, P. Kalicki 1.5 ha): Phytophthora cactorum was stopped by 2 days of drip application at 2.5–3.5% (ORP above 850 mV) on sunny days, without ammonium fertilisers.**
- **No residues: strawberries sprayed (50 ppm HOCl) and fogged (300 ppm) in a glasshouse showed no chlorate residues (EU limit for strawberries: 0.05 mg/kg).**
- **Plug plants: 3–4 morning sprays on sunny days, with enough water to soak the root ball, eliminated Pestalotiopsis, Fusarium and Gnomonia (Strawberry Plants nursery, laboratory-confirmed).**
- **Adviser's rules: spray in the evening or early morning, never before rain, within 48 hours of an infection alert. Keep the root zone moist and avoid ammonium fertilisers during drench treatments.**

Policies and Regulatory Support

EU Fertilising Products Reg. (EU) 2019/1009: non-microbial biostimulant PFC 6(B), CE 1434 (module D1), marketable EU-wide. Organic input certificate PL/SE/81/2022 (Reg. (EU) 2018/848); patent PL 244920. Fits Farm to Fork pesticide-reduction goals.

Social and Cultural Acceptance

2023 Polish Horticultural Innovation Award: Agro ECA protect as most innovative horticultural product.

Used by organic and residue-free growers; sold in Poland, Spain, Czech Republic, Slovakia, Austria, Germany, Belgium, UK.

Over 30 grower videos (Agro Smart Lab YouTube) build trust.

Transferability of the Novel Approach across countries and sectors

CE-marked under the EU FPR, so it can be marketed in every Member State. Tested on strawberry, lettuce, cabbage, cauliflower, apples, pears, blueberries, raspberries, cucumber, Chinese cabbage, tomato, pepper, wheat, barley, maize, sugar beet and oilseed rape; usable in open field, tunnels, glasshouses, nurseries and fruit stores, in organic and conventional systems.

BENEFITS

Higher strawberry yield: class I yield +17%, fruit number +10% vs untreated (field trial, Institute of Horticulture 2021)

Protection against heat waves: strawberries at 32 °C: +30% plant mass, 2× photosynthesis vs untreated (Institute of Horticulture 2025)

Grey mould and anthracnose on fruit: effective control confirmed by hundreds of growers

Root rot in tunnel strawberries: Phytophthora stopped by drip application on three farms

Healthy plug plants: no Pestalotiopsis, Fusarium after nursery treatment

BARRIERS

BARRIERS / OPEN QUESTIONS

- Legal status: registered as a biostimulant, not a plant protection product, so disease control cannot be claimed on the EU label
- Timing: no rain-fast or long-lasting preventive effect; must be applied after rain, guided by infection alerts
- No tank mixes: other products and fertilisers; no ammonium fertilisers during drench treatments
- Storage: limited shelf life: 12 months: keep cool (maximum 30 °C and dark
- Next research step: efficacy against fungi, bacteria and viruses is confirmed by national research institutes, but strawberry field trials comparing it directly with a standard fungicide programme are still needed

Systemic Feasibility Analysis: Expert insights from Literature and Field Data

FIELD	CRITERION	INDICATOR	INDICATOR ASSESSMENT	DATA VARIABILITY	DATA SOURCE RELIABILITY	EVALUATION
TECHNICAL	**Pesticide use reduction level**	Reduction of the applied volume of pesticides	moderate–high: fungicides replaced in the harvest window (up to 100% on residue-free farms)	high variability	reliable (grower reports)	**plus**
	Effectiveness of controlling target diseases	% reduction of infestation or damage caused by the target disease	high in lab / nursery tests (pathogens not detected); field efficacy data limited	high variability	reliable (lab tests)	**plus**
ENVIRONMENTAL	**Soil quality**	Impact on soil organic matter	no impact (HOCl breaks down to water and chloride; natural zeolite)	low variability	reliable	**neutral**
	Biodiversity	Impact on aquatic organisms	beneficial: replaces synthetic fungicides, no persistent residues	average variability	reliable	**plus**
		Impact on bees	beneficial: safe for bees, can be applied at flowering	low variability	reliable (producer data)	**excellent**
		Impact on earthworms	no adverse effect expected	average variability	moderately reliable	**neutral**
		Impact on non-target soil microorganisms	possible short-term reduction after drenching; re-inoculation advised	average variability	reliable (practice)	**neutral**
	Water quality	Impact on pesticide losses to surface water (runoff)	decrease: fewer synthetic active substances applied	average variability	reliable	**plus**
	Air quality	Impact on pesticide emissions	decrease; fogging uses only 60–120 L/ha	average variability	reliable	**plus**
		Impact on air pollutant emissions	no impact	very low variability	highly reliable	**neutral**
SOCIAL	**Working conditions**	Knowledge requirements	moderate: DSS-based timing, water and pH management	average variability	reliable	**neutral**
		Impact on operator / employee exposure to risk	significant improvement: non-toxic HOCl; avoid inhaling vapour	low variability	very reliable	**excellent**
ECONOMIC	**Costs**	No investment required	Applied with the farm's existing sprayer; fogger	average variability	reliable	**excellent**
		Operating cost per treatment	EUR 21–41/ha per spray (2.5%-4,0%); EUR 55 net per 20 L);	average variability	reliable (price list)	**plus**
	Outputs	Impact on yields (produced volumes)	significant increase: strawberry +17%, rapeseed +17–24%, lettuce head mass +10%	high variability	reliable (IO-PIB, IUNG-PIB)	**excellent**
		Impact on crop quality	improvement: more class I fruit; higher Fe, Mn, Si and Ca in fruit under heat, better shelf life	high variability	Reliable (IO-PIB, Agriculture University in Crakow)	**excellent**

NOTE: Evaluation based on producer-commissioned trials at Polish national research institutes and on grower reports; independent multi-site validation of fungicide savings is recommended.



Impact Highlights

Agro ECA Protect – a CE-marked hypochlorous acid and zeolite biostimulant approved for organic farming – lets growers in Poland, the Czech Republic and Austria replace fungicides during harvest with a residue-free spray that allows picking straight after treatment.

By opening stomata it also cools plants and boosts photosynthesis: institute trials show +17% strawberry yield and +30% plant mass under heat stress.

Next step: field trials measuring fungicide savings.