

Plant Protection Products : Adhesion to and distribution on treated seeds

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1. Introduction

Seed treatment with fungicides and insecticides is used to protect crops against pests and diseases. To ensure a good efficacy, each seed, hence each plant, has to be correctly treated.

Good quality seed treatment with plant protection products means that the average concentration of active substance on seeds has to be as close as possible to the target rate and that the distribution of the active substance on individual seeds has to be uniform.

To test the quality of seed treatments, several standard methods are now available and recommended, and other additional methods can be proposed.

2. Standard methods

CIPAC METHOD MT 175

Treatment of seeds with the laboratory seed treatment machinery Hege 11

Suitable for barley, wheat, maize, peas...

Seed treatment apparatus



Treatment of seeds

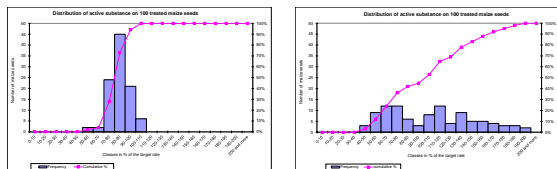


Seed-to-seed uniformity of distribution of the pesticide (analysis of 100 individual seeds)

colorimetrically (dye concentration on each seed) or

by active substance analysis (recommended by our laboratory)

Examples of distribution of active substance on 100 treated seeds



HEUBACH METHOD

Heubach dustmeter or equivalent to determine the particulate matter (« dust content ») of treated seeds.

Following encountered problems of eco-toxicity coming from dust of treated seeds, some regulatory authorities require a test to evaluate the amount of dust sent out during sowing.

Heubach dustmeter



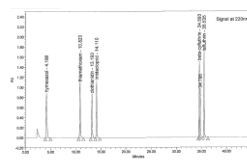
Method : ESA STAT Dust Working Group, Heubach Test, version 1 of 23.03.2011

3. Additional methods

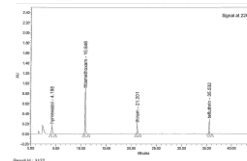
ANALYTICAL METHOD

Our laboratory recommends the active substance analysis using a chromatographic determination (HPLC-DAD, UHPLC-DAD or GC-FID).

Example of chromatogram of a calibration solution



Example of chromatogram of a treated sample



Every method used to analyse treated seeds has to be validated on its specificity (blank, untreated seeds), repeatability (of injections, of the method), linearity, accuracy (efficacy of extraction, recoveries), LOQ, stability of a.s. in standard and sample solutions during analytical phase.

4. Conclusion

This range of tests permits to ensure the quality of the treated seeds, hence the protection of each plant, and a reduced impact of seed treatment products on the environment.

CIPAC METHOD MT 194

Seed loading and adhesion to the treated seeds after a controlled dropping stress

colorimetrically (dye concentration on each seed) or

by active substance analysis (recommended by our laboratory)

Principle :

5 fallings of treated seeds and seed loading analysis to compare seed treatment between a stressed and an unstressed sample.

Illustration of the Jeff's test



Collect of the stressed sample



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