

Recommendations and field performance of Initium® based products against *Phytophthora infestans* in potato

VANESSA TEGGE¹, TOBIAS ERVEN¹, ERIC KIERS², MARJO KRUTS²,
ANGUS MURRAY³, HORST-DIETER BRIX¹

¹BASF SE, Limburgerhof

²BASF Nederland B.V., Arnhem

³BASF plc, Cheadle

SUMMARY

In this paper the results of Orvego® (Initium + dimethomorph) and Orvego Duo® (Initium + mancozeb) from trials conducted between 2009 and 2011 in the Netherlands, Germany and the United Kingdom are summarized. Orvego and Orvego Duo were tested in season-long sprayed efficacy trials and in spray-programmes. Additionally, the effects of Orvego and Orvego Duo on the protection of new growth were evaluated.

The results confirm the excellent efficacy of both products against *Phytophthora infestans* including the capability to protect growing leaves.

KEYWORDS

Phytophthora infestans, potato late blight, new growth, Initium, Orvego, Orvego Duo

INTRODUCTION

Late blight and downy mildews are devastating diseases of several crops world-wide and play an important economic role in commercial food production. Economic losses by *Phytophthora infestans* in potatoes were estimated in developing countries alone to be more than 2,7 billion \$ (CIP, Centro Internacional de la Papa, Lima [Peru]). Initium is a fungicide developed by BASF with high activity against these Oomycete pathogens. Since its discovery in 2004, Initium has undergone detailed evaluation in laboratory tests and in extensive global field testing programmes. It is remarkable for its high intrinsic efficacy against different infectious stages of peronosporomycetes. An additional key benefit is its strong adsorption to the leaf wax layer, due to molecule structure and the low water solubility in combination with the high log POW. This specific characteristic of the molecule results in very good rainfastness. However under periods with dew and leaf wetness, Initium has the capability for redistribution on the leaf. Due to this effect Initium can protect growing leaves. An excellent toxicological and ecotoxicological profile completes the requirements of a modern fungicide. During the EuroBlight Workshop 2010 in Arras, Initium and Initium containing products had been presented in detail. Respectively details can be found in the Proceedings N° 14. In this paper an overview of the trials conducted between 2009 and 2011 is given.

MATERIAL AND METHODS

Two Initium containing products are marketed in North-Europe for the control of *Phytophthora infestans*.

Orvego Duo combines the modern active ingredient Initium with mancozeb, which is the key multi-side active ingredient in potatoes. The excellent preventive efficacy against *Phytophthora infestans* is supplemented with a side effect against *Alternaria spp.* The target dose rate is 2.5 kg/ha.

Orvego contains in a liquid formulation besides Initium the locally systemic active ingredient dimethomorph. This ensures very good control of several stages in the life cycle of *Phytophthora infestans*, which provides preventive, curative and antisporent efficacy. The target dose rate is 0.8 l/ha.

Both products have been shown to have very good rainfastness and due to their good miscibility with other plant protection products flexible usage in spray programmes is possible.

In 2009 to 2011 Orvego and Orvego Duo were tested not only in season-long sprayed efficacy trials, but also in practical spray programme trials. Furthermore specific trials, e.g. protection of growing leaves and rainfastness, were performed.

Season-long sprayed efficacy trials and spray-programme trials

The trials to evaluate the efficacy of Orvego Duo and Orvego were performed as field trials according to GEP and different EPPO guidelines (especially EPPO PP 1/2 (4)). Each trial had 4 replicates; the trial design was set up as a randomized block design. The application timings were chosen according to the weather conditions and the disease development; in general the application interval was 5-10 days. Disease assessments were performed before each application and additionally according to disease pressure. Orvego Duo was compared to the active ingredients fluazinam and mandipropamid. Orvego was positioned in spray-programme trials in the first block and was compared to spray-programmes with competitor products containing mandipropamid and cymoxanil + mancozeb.

Protection of New Growth

Different trials had been conducted to evaluate the efficacy of Orvego and Orvego Duo on growing leaves. Exemplarily the results of a trial conducted in 2010 on the request of BASF by PPO Lelystad are presented in this paper.

For this trial potato plants had been grown under field trial conditions. During the phase of active growth 4 different leaf sizes were marked before the test fungicides were applied. Seven days after the application the marked leaves were collected and brought to the greenhouse. There they had been inoculated with the spore suspension (strain 98014). Once symptoms became visible assessments were made.

RESULTS AND DISCUSSION

Season-long sprayed efficacy trials

Figure 1 shows a summary of 14 field trials conducted between 2009 and 2011 in different regions of Germany.

All trials selected for the summary were performed under conditions of very high disease pressure, indicated by an average attack of 89 % in the untreated plots. Orvego Duo at the target rate of 2.5 kg/ha provided an excellent level of efficacy, comparable with mandipropamid. In comparison to fluazinam, Orvego Duo performed significantly better.

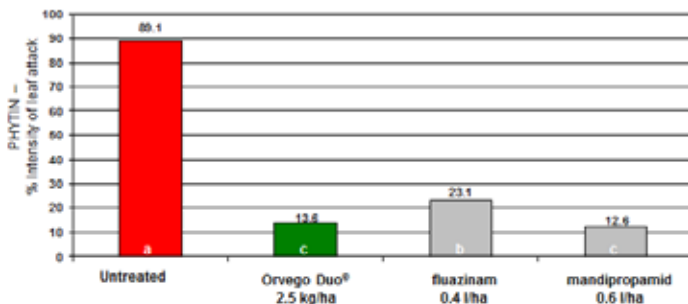


Figure 1: Summary of 14 season-long sprayed field trials (Germany, 2009-2011) Spray-programme trials

In 2010 and 2011 several spray-programme trials were conducted in the Netherlands. In these trials Orvego was always sprayed in the early application block, according to the intended positioning. The results can be compared to spray-programmes with mandipropamid and cymoxanil + mancozeb in the early block. In the second block all treatments were sprayed with Acrobat® (dimethomorph + mancozeb) and in the third block cyazofamid was used.

The assessments, which were relevant for the performance evaluation of the products in the early block, were made at the end of July/beginning of August. Summarizing all trial results, the average disease attack in untreated plots reached only moderate levels at this assessment timing. Therefore in summary no significant differences between the products in the early block could be detected. Both the reference products and Orvego provided a very good level of efficacy.

Looking at individual trial results, significant differences can be identified. For example figure 2 presents the result of a spray-programme trial, conducted in 2011 in the Netherlands. Infection rows in the trial had been inoculated mid-June. Therefore high disease pressure was already reported for the assessment done on the 25th of July (10 days after the last application in the first block). Orvego performed like mandipropamid at a very high efficacy level, while cymoxanil + mancozeb was significantly weaker.

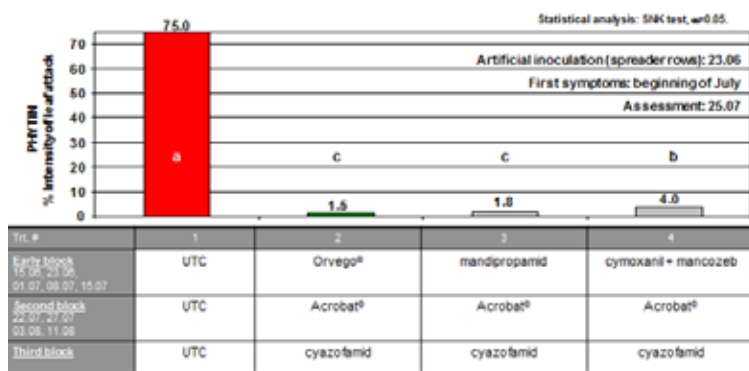


Figure 2: Comparison of Orvego, mandipropamid and cymoxanil + mancozeb positioned at the beginning of a spray-programme trial (assessments done 10 days after the last application in the first block)

Protection of new growth

Several trials were conducted to evaluate the efficacy of Orvego and Orvego Duo on growing leaves.

The columns in figure 3 visualize the results of 3 trials conducted in 2010 by PPO Lelystad on the request of BASF. Even though some variation can be seen in the individual trials, it can be concluded that Orvego and Orvego Duo give clearly better protection of growing leaves than the contact active ingredient fluazinam. For Orvego Duo these results can be explained by the redistribution effects of Initium. For Orvego the locally systemic properties of dimethomorph can also be considered a critical factor.

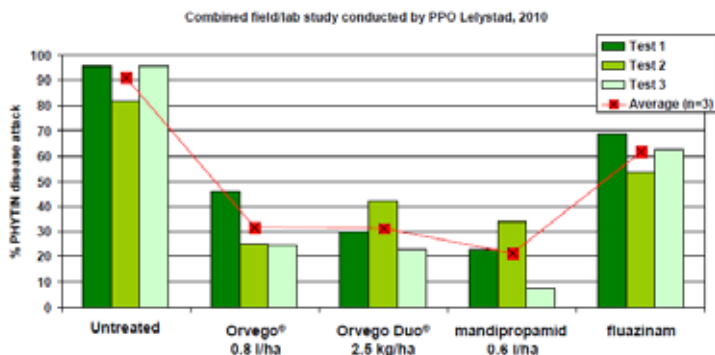


Figure 3: Results of 3 combined field / greenhouse studies evaluating the protection of growing leaves (PPO Lelystad, Netherlands, 2010)

CONCLUSION

Initium is an innovative fungicidal active ingredient developed by BASF. In numerous field trials both the Initium containing products, Orvego and Orvego Duo, have proven their high efficacy. The presented field trial results for season-long applications as well as for spray-programme applications underline the very good efficacy of Orvego and Orvego Duo against *Phytophthora infestans*. A specific characteristic of Initium products is the protection of growing leaves, which is related to the redistribution effects of Initium.

Due to good miscibility with other plant protection products, Orvego and Orvego Duo can be flexibly positioned in different spray programmes according to their strengths. For Orvego Duo a side effect against *Alternaria spp.* can be considered.

ACKNOWLEDGEMENTS

The authors would like to thank all colleagues who have contributed to the development of Orvego and Orvego Duo.

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