



# Agrikos Foundation

Agriculture and Cosmos

## New methods for tillage times successful

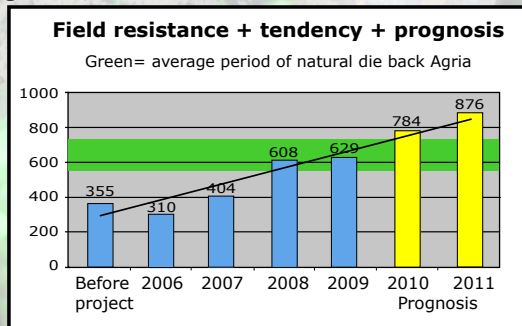
### Phytophthora in potatoes significantly reduced

The past four years five arable farms in Flevoland, the Netherlands, have participated in a project with specific tillage times for potatoes. This method is stimulated by Foundation Agrikos and is adopted by three organic and two normal farms. The purpose was to reduce Phytophthora in seed-potatoes production and resulting consumption crops.

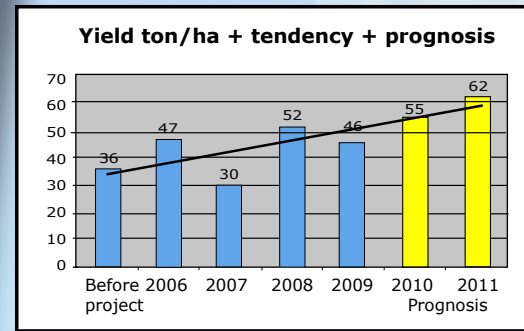
After four years the growers have altered their tillage times in such way that the intended implementation is realised for about 63%. Before the start of the project this was 31%. In organic farming this resulted in crops that could grow longer on the field before they would be infected with Phytophthora. Before the start of the project, the average cumulative burden of disease of the investigated variety Agria was 355, this meant that it was necessary to kill (burn down) the crop around July 15.

In the third and fourth year of the project this has gradually increased to a field resistance that could stand a burden of disease of 629. That score is reached around August 22 at most farms, which means an extension of the growth period with five weeks. In the third year the crop died back naturally after 4 weeks of growth prolongation. In the fourth year the cumulative burden of disease was much higher than average, so growth prolongation was only two weeks.

The chart shows the long-term development of the field resistance during the project. The tendency line shows this development. In the first year there was a regression, this is commonly seen after a changeover, but later the field resistance increased significantly.



The green bar shows the most common natural die back period of the variety Agria. With the potential improvement in the implementation, the field resistance will exceed the average natural die back period based on the prognosis.



For the start of the project the average yield was 36 ton/ha. In 2006, despite the relapse in field resistance, there was a higher yield. A lower yield in 2007 was caused by an extreme high burden of disease that year.

In the third and fourth year together the yield was on average 35% higher than before the project started. The tendency line indicates also a further improvement in the next two years, towards an almost maximum yield for Agria. This is a justified expectation, because in 2009 only 63% of the implementation was realised. At the same time the method produced a qualitative improvement in reducing growth cracks, scab and Rhizoctonia disease. Through this additional research it is possible to reach a 100% implementation of the method. Then four tillage periods are used to optimize the use of all genetic characteristics of Agria. Before the start of the project the organic enhancer used two periods, with a partly positive result.

#### Tillage periods to be used for Agria

Sun period	Alternative	Moon*	Percentage
15 Sept. -1 Nov.	18 Jan. -15 Feb.	Air	25%
1 Nov. -19 Nov.	15 Feb. -10 Mar	Fire	25%
10 Mar -19 Apr.		Earth	50%

\* Possibly one Moon period will be added

The research into the variety Agria has been executed by the growers in this project. Such research takes three to four years. When a variety-specific research is completed, this information may lead to a doubling of the disease resistance from the first year onwards. From the fifth year onwards, almost 100% of disease resistance will be reached, in accordance with the prognosis. That field resistance can only be retained if cultivation will be exploited optimally every year. The outcome decreases proportionally with a lowering in the level of tillage. The purpose is to choose the varieties of potatoes as favourable as possible, to match these with the tillage possibilities from the farms. These are the best conditions for a yearly optimized tillage time with corresponding results.

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