



## Control Measures Against Potatodiseases in South of Azerbaijan

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### Abstract

In this article have been summarized reports of Phytosanitary state of potato crops in Azerbaijan. There are given the results of work experiences against major harmful potato diseases in condition of Jalilabad region. The results have shown that the use of control measures against potato diseases drafts is effective and ecologically-balanced against the potato diseases. To the new scheme includes struggle techniques to increase the resistance of plants, there are used promising potato species Amyri 600 and Maxim, there are used as well as an effective fungicides as RidomilGold, Quadris and Revus.

**Keywords:** potato diseases, control measures, Ridomil Gold, Quadris, Revus, effectiveness

### Introduction

In the last 20 years In Azerbaijan the area of potatoes has extended in 2, 8 times. The volume of production has reached one million tons per year. Transit of large promising species makes it possible to increase of production. At this time, the market demand exceed sales, so there are imported seed and food potatoes from neighboring countries such as Russia, Iran, Turkey, Ukraine and Belarus.

There has stimulated the increasing of demandsto the expansion of the potato areas. Growth of areas and no replacement of cultivation crops from the same fields have created optimal conditions for the expansion of the species composition of aggressive strains of fungal, bacterial and viral diseases. Studies have shown that the spread of aggressive races Phytophthorainfesting (Mont) de Bari) in 2012 compared with 2000 has increased in 48%. There are increased year by year, the level of development and the spread of AlternariasolaniSor.A.alternata, SpongoporasubterranaWal.John.A bacterial rot of tubers Clavibactermichiganensissubsp.sepedonicum), striate mosaic virus Solanum virus 2 Smith. These diseases bring high crop losses and economic damage to producers [1].With the purpose to prepare an effective scheme of measures to struggle the major harmful diseases that exceeded the economic threshold of harmfulness (Phytophthorainfenstans, Alternarioz, Common Scab of Potato), there are used perspective fungicides Ridomil Gold (640gr mancozeb + 40gr mefenoksam), Revus (mandipropamid 250g / liter) score in (250g / liter difenoconazole) Kvadris 250 (250g / l azoxystrobin). There are defined regulations for the application of proven drugs.

### Objects and Methods of Researches

There are selected elements compatible to soil and climatic conditions of the region in order to expand the use of agro-technical measures in struggle against diseases. The results of pests variations come in the selection and application of agro-technical measures, depending on the optimal mode of spread of the diseases.The plant disease infecting depends on the technical and cultural measures to minimize winter reserves, ways to prevent the spread of pests, which are optimal for the elimination of the development of pathogens in direct conditions. The conditions for the spread of the pathogen is not massive, pathogens are minimized in reserves.By the low reserve of pathogens in environment is safe in disease-fighting by means (biological products, natural phytohormons, measures to stimulate the development of beneficial flora) can be used to minimize the spread.

There are researched for several years precursor plant's role in the spread of diseases in plants, potato plants in Jalilabad region in the years of 2000-2014 in continuous potato fields in order to clarify the predecessors of the different plants and planted potatoes in the fields of visual observations.There are reviewed to 20 samples in ha by observations in field, in both dioganals in every sample of 10 plants. The obtained observations results were comparative analyzed. In Jalilabad conditions there are marked in 4 point the potatoe fields after peas, clover and corn planting as predecessor, they are marked in 5 point by diffusion of Fitofthoroz , Alternarioz and Rhyzoktonioz scab.In this case they are determined in 5 point of the infection the surface of the leaves cove by Fitofthoroz and Alternarioz diseases. Rhyzokthorioz scab desease is estimated in 4 point by the level of disease and decay of oval tubers and spot disseminations. The number of deseased tubers to damaged tubers in marketable product diffusion assessment are equal by the intensity of disease spread. So scab disease stricken tuberous have been wasted as defective goods[2].

### Results

The obtained results show that the observation and records by the predecessor planting in the fields the disease corn leaves and tuberous are decreased significantly. Among the areas in each of the three variants of the diseases in predecessor corn plant field has been compared to minimal as in other options. It was observed the maximum spread of Fitofthoroz estimated in the next year in unbroken plant fields in 54.8%, Alternarioz in 32%, scab disease in 36.7%.By crop rotation the potato productivity is estimated in high 25-28%.As seen the precursor plants role are showed in various settings. There are different in all three versions of the same aqrofund of cultivated plants blooming period of green mass.However, in all 3 versions are used of the same tubers species by the same measures of watering and feeding. (Figure1). The analysis showed that the soil and plants, improvement of soil with nutrients and will ensure the normal

development of tubers with a high level of security. The green mass in 1 m<sup>2</sup> unbroken planting area is equal to 3,156 kg, in precursor green pea planting area is equal to 4,928 kg, in soil after clover planting is equal to 5,162 kg.

There are studied by the records carried during visual observations the infection limits spread of major diseases of potatoes (Table 1).

## Discussion of Results

By obtained results there were comprehensible that in unbroken planting area dissemination of *Fyftoroze* in flowering time in 54,8%, intensity was in 19,2%, dissemination of *Altenarioze* in 32,5%, intensity was in 14%, dissemination of *Scab* disease in 42,7%, intensity was in 21,4%. Dissemination of *Fyftoroze* in potato shrubs soil after green pea planting was in 31,2%, dissemination of *Altenarioze* was in 20,1%, dissemination of *Scab* disease was in 12,8%.

Dissemination of *Fyftoroze* in potato shrubs soil after clover planting was in 24,6%, intensity was in 8,2%, dissemination of *Altenarioze* was in 26,8%, intensity was in 6%, dissemination of *Scab* disease was in 10,5%, intensity was in 3,4%. Productivity in place with widespread of diseases in unbroken planting was lowest compared with other optional practices. Therefore the productivity here was in 325.6 cent/ha, however in precursor green peas field it was 416.7 cent/ha. In addition obtained potato tubers in crop rotation areas are best in trademark.

Though use of crop rotation system in potato planting will reduce major diseases, it will increase the productivity and also improve the products quality.

There are used agricultural practices and methods for enhancing the resistance of plants. To determine the optimum treatment time and maintain control over the development of the diseases, there was drawn up in short-terms of *Fyftofoze* forecasts.

## Conclusion

Optimal land soil and climatic conditions play an important role in cultivation of high-qualities potatoes [2]. Land with light mechanical textures, open and wide area with good ventilation, soil in rich with humus in reaction of pH 5.5-6, the average temperature of air is 15-25<sup>0</sup>C, relative humidity is 65-75% are suitable for the optimum development of the potatoes [3].

In the south of the country the climate of Jalilabad region corresponds to such conditions. There are carried symbolically the farm on area of 12ha. There are held economic experiences. Scheme of experiment has been in 3 embodiments. The results from obtained the new scheme of control measures of the economic results (reference) and control variants.

1. The new scheme of protection consists of the following components:

- There are chosen regionalized sorts of Amiry 600 and sort of Nevsky.
- Seeds are treated before sowing with contact fungicides Maxim KC in application rate of 0,5 liter/ton, consumption of the working liquid is in 10 liters/ton.
- As foregoer was maize.
- To increase the resistance of plants before flowering first feeding at 13:40:13 out rate of 16 kg/ha, second fertilizing after flowering at 10:10:40 out rate of 12 kg/ha.
- with a view to improve chemical control fungicides applied as follows:

At first use of fungicide spraying during the detection of the first symptoms of *Phytoftoroses* by Ridomyl Gold 4 kg / ha, at second use Revus to 1,5 liter / ha, at third use of Scor in 1,2 liter / ha, at fourth use Quadris in 1L / ha in an interval of 14 days.

For durability against external stresses, together with Rydomil Gold in the tank mixture was applied Safatonic at the rate of 1 kg / ha. For timely desiccation during the last spraying with Quadris in the tank mixture was applied at the rate of Reglon Super to 2 kg / ha. The vector control of viral diseases, such as large potato aphid and Colorado beetle, we are used Konfidor Extra in a rate of 0.5 kg / ha in 2 times.

2. Inference (economic) variant has been applied 4 times spraying with AntrakolCombi 76 to a rate of 1.5 kg / ha and 4 times spraying by Dechis at a rate of 1 liter / ha. There aren't carried out protective measures in control variant.

The first surveys were carried out on diseases during the experiences. Later, every 7 days during 60 days. The findings showed that in the experimental field of the prevalence of late *fitoftoroze* consist of 3.1%, respectively, in the standard 19%. In comparison with control variant, the biological effectiveness was accordingly to 94,1% and 64%. Experimental development options of *Alternarioz* composes 1.2%, in the benchmark of 11.2%, in control measure of 32.4%, mosaic virus is according to 10.2% , 27.4% and 48%. The biological efficacy against mosaic was in the test version of 78%, in the economic section was 48%. As a result of suspension of the harvest from the experimental variants in comparison with the benchmark yield increase was 4,1 t / ha, or 22.4%. Additional costs for a reception in the scheme wasted 1140 AZN / ha, taking into account the wholesale price for potato (0,4 manat), net income from a new scheme of struggle has been in 910 AZN / ha ( Table 2).

The harvest from the area where the new technology used to struggle schemes were of high quality, prepared by standard tubers. Results of toxicological analyzes of tubers showed that pesticide residues and nitrate nitrogen were in within acceptable limits.

## References

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Annexure

Figures:

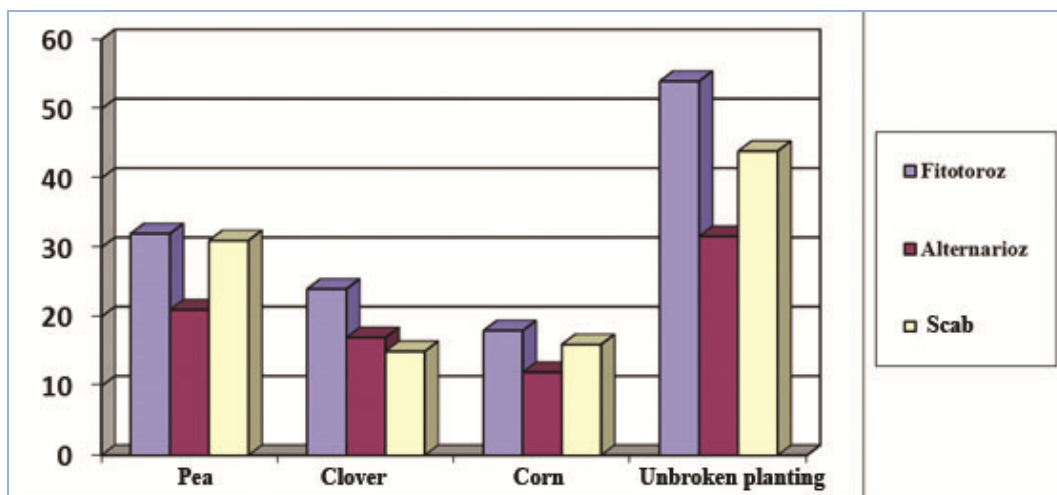


Figure1: The role of precursor plants in early potato sowing of infected with major diseases in crop rotation systems

Table 1: The role of precursor plants in spread of major diseases of potatoes

Precursor plant	Fitoforoz		Alternarioz		Scab disease		Density in %
	Dissemination, in %	Intensity, in %	Dissemination, in %	intensity, in %	Dissemination, in %	productivity, cent/ha	
Pea	31,2	11,3	20,1	8,1	12,8	403,0	1,6
Clover	24,6	8,2	26,8	6,0	10,5	416,7	
Corn	17,4	6,5	12,0	4,5	42,2	418,4	
Unbroken planting	54,8	19,2	32,5	14,1	42,7	325,6	

Usefull Commodities Factor  $_{05} = 5,4kg$

Table 2: The effectiveness of a new scheme of potatoes protection against diseases Clinic: Jalilabad region, Nevsky species

Experiment variants	Diseases distribution, in %						Productivity	Crop increase to t/ha, in %	Costs complements to receptions in AZN / ha	Net income in Azn / ha	HCP <sub>05</sub> , kg
	Phytophthora infenstans (Mont) de Bari		Alternaria solani Sor.		Solanum virus 2 Smith.						
	Distribution	Biological effectiveness	Distribution	Biological effectiveness	Distribution	Biological effectiveness					
Experimental fields	3,1	94,1	1,2	97	10,2	78,7	18,3	4,1т; 22,4	1140	910	4,1
Etalon: economical fields	19	64	11,2	78	27,4	42,9	14,2	-	-	-	
Control: Raw fields	52,8	-	32,4	-	48	-	8,9				