



THE ELEMENTS OF INTEGRATED PLANT MANAGEMENT (IPM) IN POTATO BREEDING

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ABSTRACT

At the moment demand is high potato harvest. But experiments shows that it is impossible to grow high and qualitative harvest without to organize protection of plant. Since many years method chemical protection created many discords and it is still creating. This protection method against harmful organism is not only useful but also create a lot of problems and difficulties at the result ecological balance is disturbed. Disturbing of ecological balance damaged biosphere. That is why natural objective law forced and cause natural calamity and abnormal developing. Accidentally using pesticides and agrochemical remedy is caused pollution of environment gather poison remainders the harvest, decreases of harvest and etc.

KEYWORDS: *plant of potato, ecological factors, loss of harvest, integrate growing technology, methods of control etc.*

INTRODUCTION

Nowadays the agrosenose of potato is used some elements of IPM for the purpose to high the harvest. Modern condition the system of integrate is regulate measure among the population, in the population and environment in the agrosenose. The superiority of integrate measures are undermentioned:

- 1) To diminish pesticides and agrochemical matters gather poison remainder in the harvest;
- 2) To regulate the population density of fauna in agrosenose;
- 3) To protect and raise in artificial form entomofags and microbe- antagonists density of population;
- 4) Not to form durability against pesticides in harmful organism;
- 5) To prevent from pollution of environment ;
- 6) To regulate relations of human and nature ;
- 7) To form healthy human generation.

Potato is used as decorative plant, food-staff, raw material for industry , the object of investigation and etc. The harmful organisms which damaged the potato plant must be in the centre of attention. It is necessary to take into account the plant- fitofag- entomofages (microbe- antagonist) mutual connections, the influence of pesticides or agrochemical matters mustn't break these connections.

The investigations show that every year in the potato sowing each hectare lost till 70 % harvest. Investigations (.....) show that different factors caused the loss of harvest. Farmers prefer against harmful organisms. Sometimes is caused treat with a mordant addition to expenses, the pollution of environment, diminish of harvest, gather poison remainder and etc.

MATERIALS AND METHODS

The factors which cause the harvest are these:

Abiotic factor:

- 1) Loss observing in the reason of the damage of plants from the effect of the abiotic factors (temperature, humidity, rain, frost etc.);
- 2) Loss creating in the reason of pathological process.

Biotic factor:

- 1) Physiological loss;
- 2) Loss observing from the effect of harmful organisms;
- 3) Loss observing in the reason of development of barren scion;
- 4) Loss observing when vegetative plant material doesn't germinate;
- 5) Insects make harvest loss when flowers pollinate;
- 6) Loss observing in the reason of harvest size (big or small);

Hidro-edafic factor:

- 1) Loss observing when rock water is near the surface;
- 2) Loss observing in the reason of salted;

- 3) Loss observing in the reason of lack of nutrition;
- 4) Loss observing from the harmful effect of different elements;
- 5) Loss observing from the effect of organoleptic, physical, chemical structure of the arable layer;
- 6) Loss observing from the effect of unsatisfactory watering.

Anthropogenic factor:

- 1) Loss observing from the application of monoculture;
- 2) Loss creating by the creation of feed base for harmful organism;
- 3) Loss observing from the effect of the pesticide;
- 4) Loss creating from undoing profitable fauna;
- 5) Loss creating according to the time of planting;
- 6) Loss observing in the reason when fertilizer doesn't apply correctly;
- 7) Loss observing from the effect when agrotechnical events doesn't apply in the optimal time and correctly;
- 8) Loss observing in the reason when farmers don't have practice;
- 9) Loss observing during the keeping;
- 10) Loss observing seasonal planting isn't done;
- 11) Loss observing during the plants damage;
- 12) Loss observing during the harvest time and its transport;
- 13) Loss creating in the reason of pollution of environment.

Heliophysical factor:

- 1) Loss observing from the photoperiodism;
- 2) Loss observing from the effect of season (spring, summer, autumn and winter).

Geogeographical factor:

- 1) Loss observing according to the relief where potato agrosenose is placed.

DISCUSSIONS AND RESULTS

Scientifically and technical development requires to improve (to perfect) IPM. This system application must provide to maintain balance in the environment, not to collect poison residue in the agricultural crops. It must provide normal life condition of living organism in the biosenose and biotope. Lately IPM sometimes is called "the control of population". It shows that it consist of to protect biosphere, it's purpose not to undo harmful organism. That's why IPM must be fulfilled systematically on the base coordinating of prognosis, quarantine, agrotechnical, genetic, biological, mechanical, physical and chemical methods. This system must improve year by year.

IPM consist of different methods and means. The superiority of IPM is connect with the coordinate application of such method. We must notice that it doesn't give an opportunity to find the advantage of IPM. We haven't paid attention to the differences between simple and IPM for a long time. We looked them in the same way and results were unsatisfactory. That's why methods and its goals which include IPM technology in the potato growing must be specified (Table 1).

But it needs to remember that showing measure must apply suitable to the local condition. When we use this method of control we must take into account land- climate condition and geographical position. If it needs some additions refusals. For this purpose technological maps have to compile.

Sometimes the sowing area which made the highest agrotechnical rules can be unsuitable for any crops. Organic or inorganic matters of sowing thik, the water regime and other measures can't be suitable for any plants. That's why making the sowing area first of all it must define growing plants. Even in shift sowing the area has to made suitable for the demand of any crops.

Table 1
Integrated Plant Management (IPM)

Components of technology	Sphere of action	Goals
1	2	3
The base of information	To collect theoretical knowledge	About species content spreading harmful organisms
		About harmful organisms making negative impression
	To detect factors which reason harvest loss	The organization of struggle
		To prevent pollution
	To collect information about quarantine organisms and about control of methods against of them	Quarantine pests, disease and weeds
	To learn ecological condition	Application of plant area
The definition of ecological factors indicator in the existents area		
To organize technological map	To remove additional costs	

		To maintain ecological balance
Prognosis	Warning about manifestation of indicator of ecological factors	Preparation to the control methods
	Warning about development method of harmful organisms	To prepare development plan of prognosis
	To detect microbial antagonists and entomophags (predators and parasite)	To detect opportunity of natural infected of harmful organisms
		To determine the efficiency of biological control
	To learn physiological condition of harmful organisms	To learn egg harvest and density of population
	To learn wintering reserve of harmful organisms	Organization of being provided with remedy
Prognosis about uninfection diseases	Study ecological (abiotic, biotic, antropogen, hidro- edafic, heliophysical, geogeographical) factors	
Quarantine	The monitoring of seed material	Take out damaged and infected materials
		To prevent from spreading new harmful
	To isolate planting area from sky	To prevent spreading pests, disease and weeds
	To observe regular in the agrosenose	To undo plants infecting with virus
		To find out control time against harmful organisms
		To mark plants which do not belong to sort and to collect separately harvest
To undo intermediate insects		
To disinsection and disinfection using technique and technique maens	To prevent spreading harmful from one area to another	
Agrotechnical control	Crop rotation	To increase fertility in the arable land
		The protection from harmful organisms
		Guaranteeing the use of the arable land during of year
	To undo reap (xora- məhsul yığıldıqdan sonra sahədə həmin məhsuldan bitən bitkilər)	To undo source of harmful organisms
		To create unsuitable condition for harmful organisms
	Collecting the water of rain or snow in the area	To provide humidity in the arable land
		To prevent erosion
		To create unsuitable condition for the winter reserve of harmful organisms
	Applying mixed planting	Repellent for harmful organisms
		To organize control between harmful organisms
	To keep seed material in optimal condition	To prevent physiological grow old (aging)
		To prevent damaging crops with harmful organisms
	To clean arable land from stone and plant remains	Improving the structure of arable land
		To undo wintering reserve of harmful organisms
		To improve watering regime
		Regulating the temperature of arable land
	To smooth of arable land	To provide the grow warmer of arable land in the equivalent level
		To provide humidity of arable land in the equivalent level
To provide being the same deep seed materials		
To provide growing shoot of the young growth in the same time		
The main tillage	To undo wintering reserve of harmful organisms	
	To provide airing on the arable land	

		To provide humidity on the arable land
		The speed of decaying plant remains
	Re-tillage	To undo weeds
		To friable on the arable land
		To protect humidity on the arable land
	Liming	To regulate pH of the arable land
		To create unsuitable condition for the harmful organisms
	Fertilization	To increase of fertility
		To increase of the temperature of the arable land for development of the seed
		To improve airing in the arable land
		To provide friable of the arable land
Agrotechnical control	The determining of planting time, deeping and scheme	To protect from the harmful effect of ecological factors and harmful organisms
		To provide the need of water, nutrition element and sun energy
		To choose optimal condition for agrotechnical measures
	Seed planting	Correctly placing of the tubers on the hole
		To provide growing
	To plow or to spade row distance Earth up	To improve airing
		To undo different development stage of the harmful organisms
		To prevent of evaporation
		To regulate the process forming of tubers
	To clean watering canals from weeds To destroy weeds around of the arable land	The protect of the different effects (mechanical effect, the effect of the sun, damaging from harmful organisms) of the tubers
		To undo the source of harmful organisms
		To destroy infection source, pest and weeds
	Winter watering	To destroy of the harmful organisms
		Gathering dampness in the arable land
	Watering	To prevent physiological process in the plant
	Drop watering	Regulate pH of water
		To prevent washing reserve of the food matter
	Feeding the edge of the root	Restoration the food insufficiency
		Photosynthesis, the process of breathing, reduce chlorophyll
		To prevent for developing of the harmful organisms
Forming of drainage	To remove water out of sowing area	
	Prevent from becoming of salted of the arable land	
Forming of the being carried	To prevent from injured	
	To prevent from disease and its spreading	
Sowing scheme	Not to loss of the arable land and protect moisture	
	Not to injure of the tubers in the earth up and harvest time	
To gather of harvest, assorted and drying in optimal period and shot time	To prevent from injured	
Before keeping to dry potato seeds	To protect from the harmful organisms	
Agrotechnical control	To clean unfit tubers in the area	To destroy infection sources
		To destroy wintering sources of the harmful organisms
	To repair and clean of the storage	To create unsuitable condition for the harmful organisms

		To fulfill the keeping regime
	To cut chopped straw (straw- kartofun yaşıl kütləsi) for the compost	To prevent from being injured the tubers of potato
		To destroy the source of harmful organisms
Mechanical control	The application of trap	To destroy the harmful organisms
	Forming of safety stripes	Protection from ecological factors and harmful organisms
		Prevent from erosion
	To gather rain water and snow	Provide dampness for the development of plants
		To create unsuitable condition for the harmful fauna
	Set fires on the night	Protection the plants from the frost
	To shake the plants	For destroy pests
		Plant protection from the frost
	To destroy unnormal plants in sowing area during the season	Prevent from disease
		Prevent from undesirable dusty
	To gather the different stage of the pests with exqaster (vacuum cleaner)	To reduce density of population of pests
	The application the smok of plant remainders	Protection from spring and autumn frost
Physical control	To enrich the seed material with the oxygen	To speed the process of germinate
		Durability against the harmful organisms
	The solarisation of the land	To destroy the weeds
		To reduce density of population
	Yarovization	To provide begin developing of the all bud (eyes)
		To become more active the energy of germinate of seed
		To find out disease tubers
	To turn green the seed material	To improve stability against the harmful organisms
	To dry the harvest	Protection from the harmful organisms in the storage
		To lengthen of the keeping period
	To organize air regime in the storage	To improve the condition of keeping
Biology control	Using the entomophags and microb-antagonist	Protection from the harmful organisms
		Restoration and protection the ecological balance
	Using insectivora	To reduce density of population of pests
Biology control	Using the plants which involve or repulsive of harmful organisms	Protection from the harmful organisms
	Using from feromons	Providing the sufficiency male individual
		Providing the dezorientasion
	Using the hemosterilization	Providing the sterility
	Using the kairomone	Attraction of the entomophages
	Organize safety stripes	Involving the harmful organisms
	Application of fitonsids	To destroy harmful organisms in different stages
	Antihormone (juvenoid)	To destroy harmful organisms in different stages
Genetical control	Sorts of region	Durable against the ecological factors
		Durable against harmful organisms
	Choosing seed materials	Suitable for demand
	Durable sorts	Durable against ecological factors
		Durable against harmful organisms
		For the special purposes
Chemical control	Processing tubers before keeping	Increasing durability against harmful organisms
	Processing tubers before sowing	Protection from harmful organisms

	Using of selective pesticides	Using of pesticides by Economic Injury Level (EIL)
	Application of bait (lure) before and after sowing	Protection from soil harmful organisms
	Fumigation of storage	Destroying harmful organisms in the storage
	Application of the pesticides to arable land	Destroying harmful organisms in the arable land

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