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# ***DIPLOMA THESIS***

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*«Economic efficiency of turnip cultivation technology »*

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## **Introduction**

Experts believe Uzbekistan now has every chance to gain a foothold in the global food market. The country has enormous agricultural potential and experience in agricultural production and is well known in the neighboring markets for its fruit, vegetables and grapes. There are new challenges facing farmers at this stage. These are introduction of modern methods and technologies of fruit growing, as well as farms of new type that will not just export their products, but also process them.

Therefore, agricultural sector in Uzbekistan now places particular emphasis on improving farming of fruits and vegetables, production, creation of fast, productive and disease resistant varieties suited to local climatic conditions. There are already successful examples of farms in Asaka, Bostonliq, Jomboy, Zangiota, Parkent, Samarqand and Yangiyul districts specializing exclusively in horticulture and viticulture.

As a result, in addition to increasing volume of agricultural production, Uzbek farming demonstrates growth in exports. Fruits, vegetables and melons grown in the country are exported to Germany, India, Korea, United Arab Emirates, USA, Turkey and CIS countries. In 2011, foreign buyers were delivered 226,000 tons of fruit and 147,000 tons of grapes.

Vegetables, as well as some other foodstuff, are necessary for development of growth and organisms ability to live. Their structure includes vitamins, minerals, organic acids and set of other difficult organic substances. The daily diet of the healthy person should contain vegetables not less, than 25 %. It is necessary to use daily approximately 300 g of potatoes and 400 g of vegetables. Under the data, on the average in a year the use of vegetables per capita is of 128-164 kg, among them : white cabbage - 32-50 kg, a cauliflower, Brussels sprout - 3-5 kg, tomatoes - 25-32 kg, carrots - 16-20 kg, cucumbers - 10-13 kg, beans - 5-10 kg, onions - 16-20

kg, pumpkin, vegetable marrows - 2-5 kg, sweet pepper of-7 13 kg, peas - 7-8 kg, fragrant vegetables - 1-2 kg and other kinds of vegetables - 3-5 kg.

## **Chapter I. Development of farms activity in agriculture and their place in vegetable growing**

### **1.1 Putting in order of farms activity and its legal bases.**

In independent Uzbekistan there was a set of changes both in national economy branches, and in agriculture. «The Uzbek model» at transition to market economy has reached sets of the purposes. Transition to market relations, business development, the statement of private property– so are characterized the basic directions of national economy reforming. All these changes occurring for years of independence, have affected and agriculture development. Today the vegetables manufacture is in prosperity owing to farm and peasant economies. Mostly their aspiration and the diligence directed on increase of efficiency of the economy, promote formation and development of farms of agriculture of the country as the branch of high technologies. The President and the government pay much attention to development of farms. The proof of it is the set of decrees and the decisions, accepted by the President and the government.

Here are some of them: the Regulation «On a farm economy» which was accepted in April, 30, 1998 and in 2004 was accepted in the new edition; the Regulation №8 of the Cabinet of January, 5, 2002 «On transformation measures of country enterprises into a farm»; the Regulation of the Cabinet №607 of December, 24, 2004 »On development of a farm and its actions for 2005-2007»; the Decree №3342 of the Presidents of Republic Uzbekistan of October,27, 2003-year «On the concept of development of a farm for 2004-2006»; the Decree №3226 of the President of Republic Uzbekistan of March,24, 2003 «On the further strengthening of agriculture in the basic directions»; the Regulation №514 of the

Presidents of Republic Uzbekistan of November,21,2006 «On measures of transformation of the rural enterprises in a farm for 2007». It is possible to tell that all these documents have created a standard - legal base of rural and farm economy».

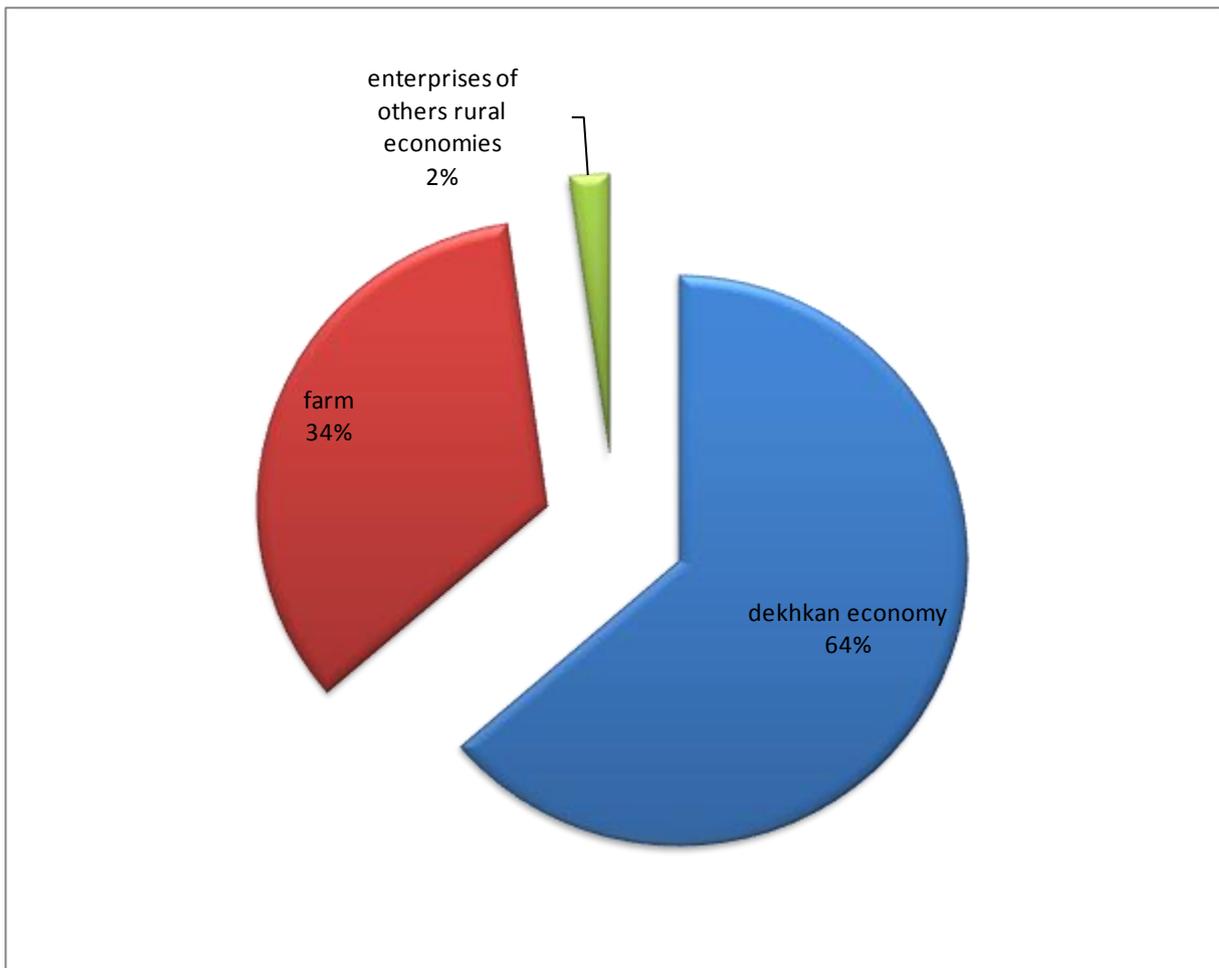
According to the President, prosperity of agriculture in Republic is connected with distinction of development of economy: « We should understand a word Prosperity first as a development of the new form of agriculture that the person felt the owner of land, to lift high productivity of soil, to improve and provide with the newest technology, from different sides to support farmer and peasant economy, and also to help prosperity of living standards of the rural people».

The world experience of the market has shown that farmers and peasants make raw materials for the market and it is convenient for sale.

Manufacture of raw materials of a farm should have high strategic indices. But, despite it, the production of farm economy is lower, than of peasant economy.

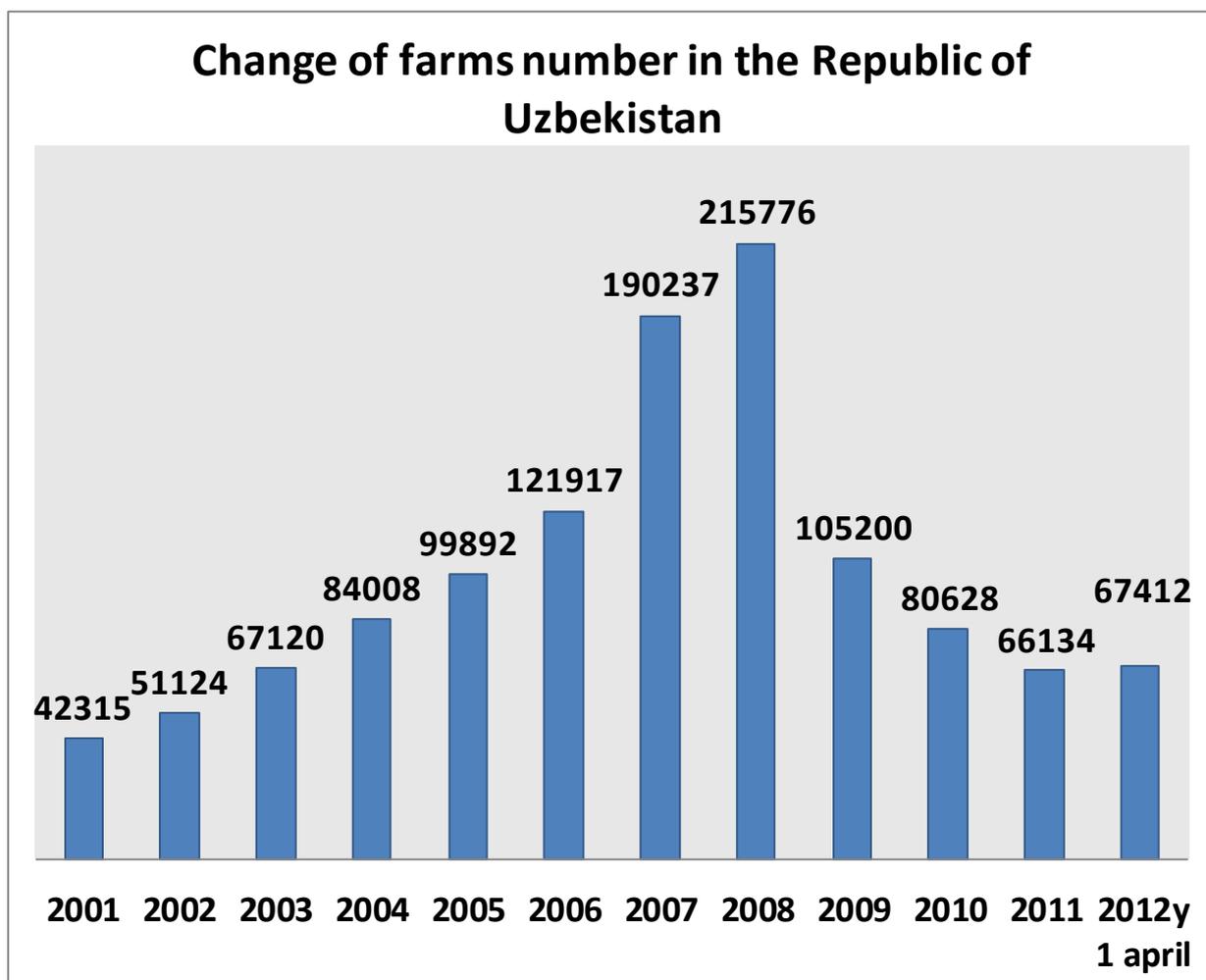
Farms have the big possibilities for introduction of the advanced highly technological devices of mechanization of agriculture, the organization of processing of production, its delivery to the market not only in a crude kind, but also in the form of half-finished products, finished production.

By January,1, 2012 the manufacture index of all products of agriculture on industrial economies has made: a dekhkan economy 63,7 %, a farm of 34,1 %, and the enterprises of others rural economies of 2,2 %. (The Diagram 1).



**Diagram 1.** Results by January,1, 2012 of agricultural production manufacture in percentage.

By April,1, 2012 it has been shown that there are 67412 farms and 1,4 million persons are provided by work there. Among them 36 600 farms are engaged in cotton growing and grain growing, 16 600 economies in gardening and wine growing, 3600 in vegetable growing – melon growing, 7300 in animal industries and 3300 in other directions. 47 449 farms are the members of the Council, it includes 70,4 % of an economy. (The diagram 2).



**Diagram 2.** Change of farms number in the Republic of Uzbekistan.

In view of the World economic crisis of 2009 in Uzbekistan for 2009-2012 a number of actions for all directions of an economy has been made.

In Tashkent, has been spent the international scientific conference where the question of world crisis and its avoidance (on an example of Uzbekistan) and its actions for 2009-2012 with a view of struggle against crisis was discussed.

The infrastructure necessary for their effective development is developing too, and the important role in it plays the public association of farmers – Association of farm economies. For example, in areas by association the centre of rendering of services to farms is created in which it is possible to use services of the lawyer, the bookkeeper and the expert in purchases. Already on Republic work about 160 of such centers. Associations organize the educational centers, the seminars devoted

to the decision of pressing questions. The special place in educational programs occupy the organizations of foreign training for farmers. Domestic farmers have visited Germany, Israel, Egypt, Turkey, Malaysia, Japan and other countries.

The great attention is given to technical modernization and introduction of high technologies. 36 research centers of the Ministry of rural and a water economy promote farms for this purpose. In scientific institutions the high-yielding grades of cotton, grain, alfalfa, kenaf, fruit-berry, vegetable - cucurbitaceous and forage crops are created, the cars and mechanisms on harvesting are improved, the new traditional and nonconventional kinds of fertilizers and means of biological protection of agricultural crops cultivation are developed. And the country enterprises purposefully work on expansion of the nomenclature of the goods necessary in the given sphere. Among them the Tashkent tractor factory and other enterprises make not only agricultural machinery, but also the equipment for agricultural products processing.

## **1.2. The analysis of vegetables cultivation in the Republic**

In Republic of Uzbekistan there is developed and being implemented a large-scale program of social-economic development, in which central place is given to improvement of the welfare of the nation, and for the purposes of achieving this goal there was made a stipulation of effective functioning of the systems of markets, which are intended for satisfaction of various needs of people.

In realization of the put forward goal the great importance is given to satisfaction of the growing demands of the population in fruit-vegetable and grape products which constitutes a considerable part of the fruit vegetable market of the country. The solution of this issue is assigned to a fruit-vegetable and grape sub-system of the agricultural system of the republic.

The role and value of the fruit vegetable and grape sub-system is not only in satisfaction of demands of people in valuable grocery products, but also in its

solving such important social issue as employment of the population. Taking into account the steady growth of a population, especially in rural areas, the last mentioned issue has a special importance in Uzbekistan. It is necessary to mention, that during the years of economic reforms there has occurred big changes in a fruit-vegetable and grape sub-complex of agrarian and industrial complex of the republic. There were established market forms of doing business and were put on new goals on stable satisfaction of demands of the population in its products and on effective functioning of this field in conditions of the process of liberalization of economic relations. The market of fruit-vegetable and grape produce of Uzbekistan represents the set of branches, spheres and kinds of activities of the various forms of property, united by the nature of their purposes, closely connected with each other in technological, organizational, and economic aspects. Thus each of the participant of market relations pursues an aim - to realize his economic interests, which do not always coincide and sometimes have controversial character. Thereupon, the goal of the market of fruit-vegetable and grape produce consists in considering more completely the coincident economic interests of the participants and to apply market levers that would promote an effective combination of interests for the sake of achievement of the ultimate goals[18].

At that, special distinguishing features of the market of fruit-vegetable and grape produce are taken into account, particularly, large number of manufacturers and consumers, seasonal nature of manufacturing, great dependence on weather-climate conditions, especially in the fields of gardening and wine growing, small transportability of produce and difficulties of its storage.

These and other features reflect on the organization of a fruit-vegetable and grape sub-complex, and on its economy. In maintaining the operation of fruit vegetable and grape sub-complex also take part the social infrastructure, which includes research and development organizations and middle and higher special educational organizations, which provide employees for this sub-complex. All these and other members of the functioning of a fruit-vegetable and grape sub-

complex co-operate with each other by the means of mechanisms of organizational economic relations, among which special place is taken by contracts, which play an important role in the activity of participants of a sub-complex. As a criterion of efficiency of functioning of the market of fruit-vegetable and grape produce was taken the degree of satisfying of the demands of population and society, as a whole, in vegetables, fruits and grapes by quantity, quality, assortment and cost.

The analysis of the condition of the market of fruit-vegetable and grape produce of the republic and of its development during 1990-2008 shows us steady development of this sub-complex in the given period. For example, the land areas for crops of vegetable cultures have increased during these years for 9,9 %, and of fruit and grape plants - for 8,5 %.

Regarding the average crop effectiveness, in 2008 for vegetable cultures it has increased for 67,1 %, as compared to 1990, fruits - for 75,5 %, and grapes - for 1,6 %. Thanks to these positive changes there has considerably increased the total manufacture of: vegetables - for 83,5 %, fruits - for 124 %, grapes - for 6,2 %. Only for grapes growth of total manufacture for 1990-2008 was lower than the rates of the growth of population which constituted 31,5 % [18].

The condition of the market of fruit vegetable and grape produce is best described by indications of its actual manufacture counted per person of the population of Uzbekistan and their comparison to available standards of consumption. As we can see, the problem of production of vegetables and grapes for satisfaction of internal demand in the republic is generally solved. Though obvious backlog is observed in fruits, and this issue should be taken into account when perspectives of further development of gardening are being developed [18].

During the years analyzed (i.e. 1990-2009) in Uzbekistan there were essential changes in social-organizational structure of manufacturing of fruit-vegetable and grape products. If, for instance, in 1990 in manufacturing of such products the main producers of the republic were agricultural companies in the form of “sovhozes” (state farms) and co-operative societies (collective farms), and to some

degree individual agricultural companies, in 2007 they were totally replaced by farming companies and individual agricultural companies. The share of manufacturing of vegetables by the farming companies in 2007 was 33,2 %, of fruits - 45,7 %, and of grapes - 54,5 %. The share of almost all of the remaining total manufacturing belonged to individual agricultural companies. Generally we can conclude that in a fruit-vegetable and grape sub-complex of agrarian and industrial complex of republic there has been completed the social and economic transformation for the benefit of a private sector. Now the degree of satisfying of the demands for fruit-vegetable and grape products completely depends on the functioning of farming and individual agricultural companies. Currently great attention is given to issues of optimization of the production of fruit-vegetable and grape produce by specialization of the farming companies, what would allow rational usage of industrial resources. Also there is put a question about increasing the sizes of small farms that are functioning ineffectively because of the lack of conditions for them for rational use of modern achievements of scientific and technical progress, and also intra-industrial cooperation of the fields, that would allow to maintain fertility of soil.

In this connection we believe it would be expedient to organize profound scientific research on the problems of optimization of the agricultural production based on a private form of ownership. Giving due to agricultural and farming companies in supplying the population with fruit-vegetable and grape produce, it is necessary to acknowledge the factual necessity in formation of such forms of business as co-operative societies, agro-firms, various associations and associations of agro industrial nature and servicing sub-complex, since separately taken farming and agricultural companies due to their economic weakness are lack of ability to rationally organize half-finished products, transporting, storage, and industrial processing of fruit vegetable and grape row materials and to achieve maximum effect[18].

Therefore there is a necessity in creation of larger infrastructural divisions on

servicing of a fruit-vegetable and grape sub complex which should be given all-round organizational support, to provide the favorable financial and credit conditions, to help in providing the qualified specialists, marketing developers and help with recommendations[18]. Their development will promote integration agricultural and industrial production, and thereby solve important social economic problems of employment of rural population and increasing their welfare. In the future the created agro-firms and agro-industrial associations should become a kernel of a fruit-vegetable and grape sub complex of the agrarian and industrial system and play the major role in increasing the economic efficiency of its functioning in the conditions of market economy. In effective functioning of any market, including the market of fruit-vegetable and grape production the important role belongs to an exchange and sale. The analysis of the existing system of sale of fruit-vegetable and grape produce in Uzbekistan shows in particular the necessity of creating co-operative societies on a voluntary basis for production and sale of fruit-vegetable and grape produce. They can use the method of production based on contracts, have their own infrastructural divisions, specialized stores in agricultural bazaars and in other places of cities and settlements.

Of certain help to agricultural companies would be establishment of markets of small retail sale of fruit-vegetable and grape produce. One of the major factors providing steady and effective functioning of the market of fruit-vegetable and grape produce is marketing, as a set of actions aimed on effective organization of production and sale activity.

At the present time the organization of marketing activity in the republic is at the stage of formation and development, and yet it does not totally cover all branches of the market of fruit-vegetable and grape produce, especially its basic branch – agricultural and farming companies. Many of them do not know well the conditions of the market of a concrete kind of fruit-vegetable and grape produce, and for that reason they suffer losses of profit. In this connection we consider that it would expedient to create at the Ministry agricultural and water management of

Uzbekistan the Republican center of marketing researches and market conditions forecasting on main directions of branches of agrarian and industrial complex, including a fruit-vegetable and grape sub-complex, and to assign to it performance of the main functions on marketing, including coordination of marketing activity of separate subjects of business and regions.

At the regional and local levels it would be expedient to establish an independent center of marketing services for carrying out marketing services by orders of manufacturers of fruit-vegetable and grape produce, for certain payment.

The roles of foreign economic relations are important in effective functioning of the market of fruit-vegetable and grape produce. It is important to mention, that the republic has a large potential to expand the market of fruit-vegetable and grape produce by strengthening and developing the foreign economic relations with the countries of near and far abroad. But it must be paid great attention to improving the quality of the made products, for example, producing them in the packaging that would meet international standards, and to improve advertising and organization of their sale according to the laws of market. We believe that all these and other measures will promote the further increase effectiveness of the market of a fruit-vegetable and grape sub-complex of Uzbekistan[18].

For January-September of 2012, the agriculture production in Uzbekistan has made 18.042 trillion sums. This index is on 7.1 % more than in 2011. It includes 10.175 trillion sums which has made peasant economy (7,2 %>), the animal industries have made 7.867 trillion sums (7.1 %>).

In 2012 in comparison with 2011 the cultivation of potato was more on 123 %, of vegetables on 118.7 %, of watermelons on 112.2 %, of meat on 109.7 %, of milk on 110 %, of eggs on 136 %. In 2013 in comparison with 2012 cultivation of potato is planned on 208.3 %, of vegetables on 159.7 %, of watermelons on 277.4 %, of meat on 106.0 %, of milk on 115.0 %, of eggs on 147.4 %. In 2012 (January-September) the farmer economy has made its production on 6063 billion sums or on 6.5 % more.

Over the last 5 years, the manufacture of fruit and vegetables has grown by 1.7 times. Farms, agro firms have created more than two hundred (200) enterprises for processing of vegetables and fruits.

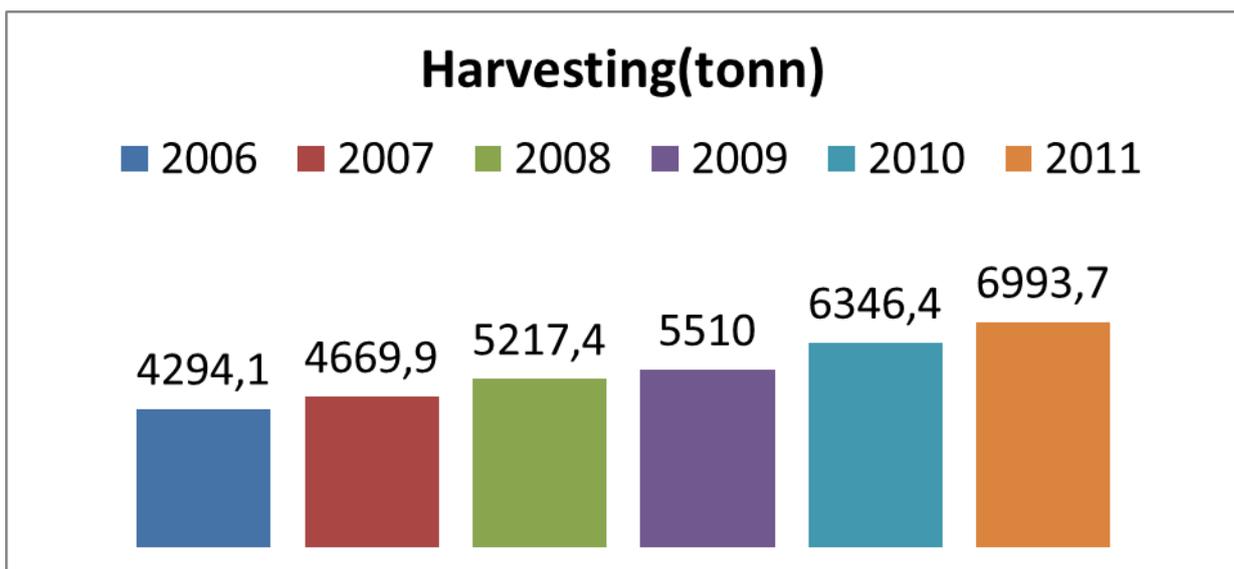
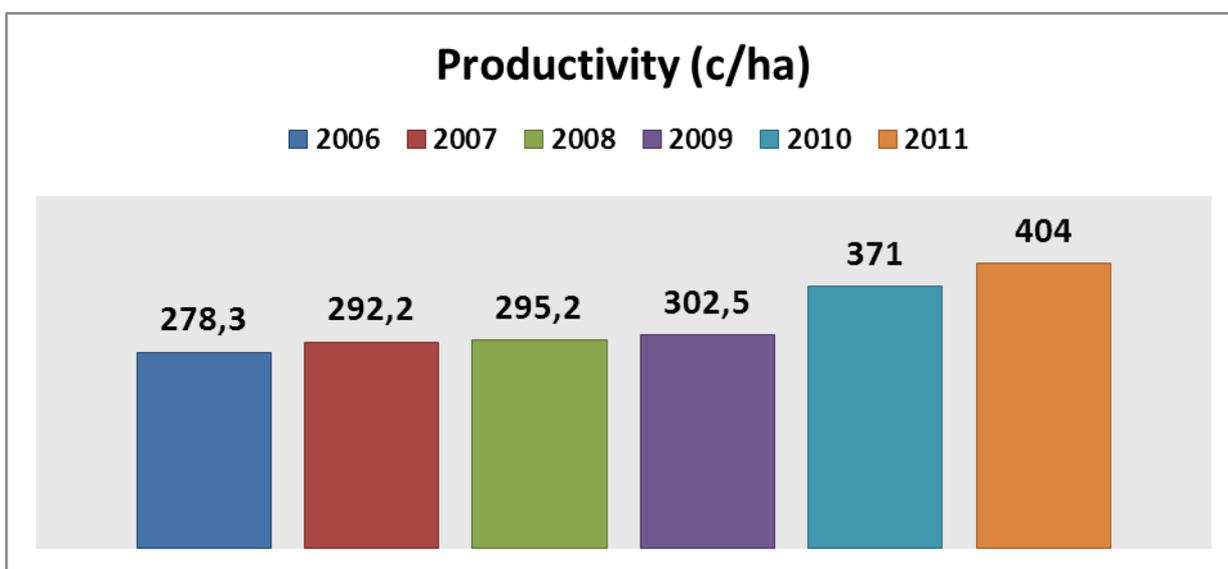
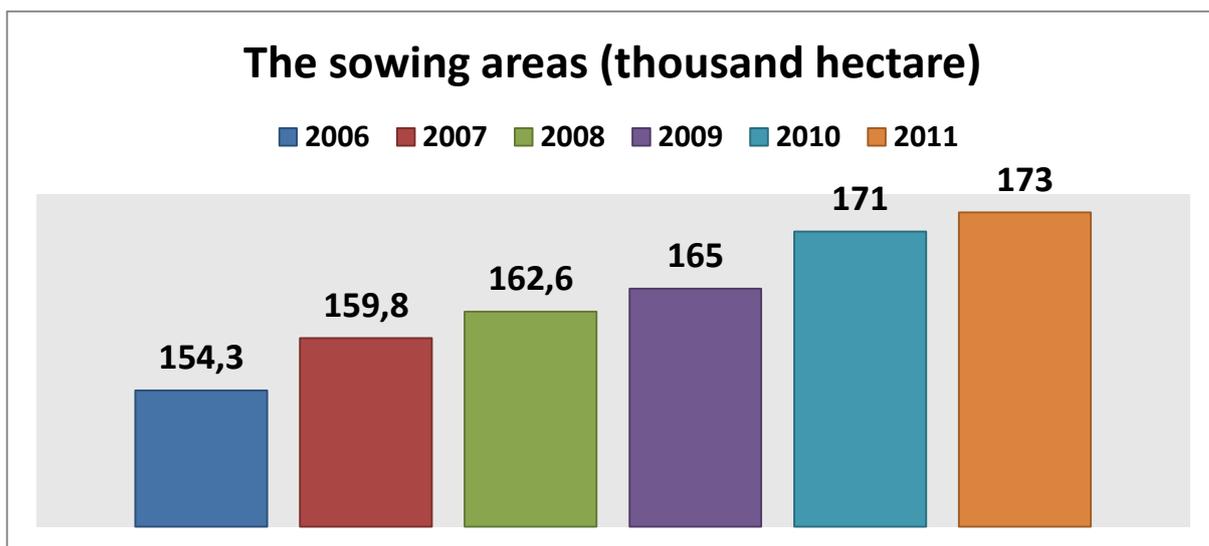
For 2011 year, the farms have harvested the cotton on 26.5 centners from hectare, grains – 48.5 centners from hectare, potatoes – 195.9 centners from hectare, vegetables – 262.4 centners from hectare.

The list of production of vegetables and melon cultures over the world: China: 202-205 million tons, India: 68-75 million tons, the USA: 34-36 million tons, Turkey: 17-21 million tons, Italy: 12-15 million tons, Russia: 11,5-14,2 million tons, Japan: 11-13 million tons, Iran, Mexico, Spain, France, Indonesia: 6-11 million tons.

The Uzbekistan is almost completely, owing to its fields, provided by fruits, grapes, vegetables and melon cultures. And there is a worthy contribution of farmers. In particular, in gardening and wine growing over 22 000 farms and more than 4360 farms in the field of vegetable growing and melon growing are working nowadays. According to experts, today they bring the powerful contribution to the achievements put in the country with a view of saturation of the market by vegetables, fruit all year long at the expense of a hothouse economy.

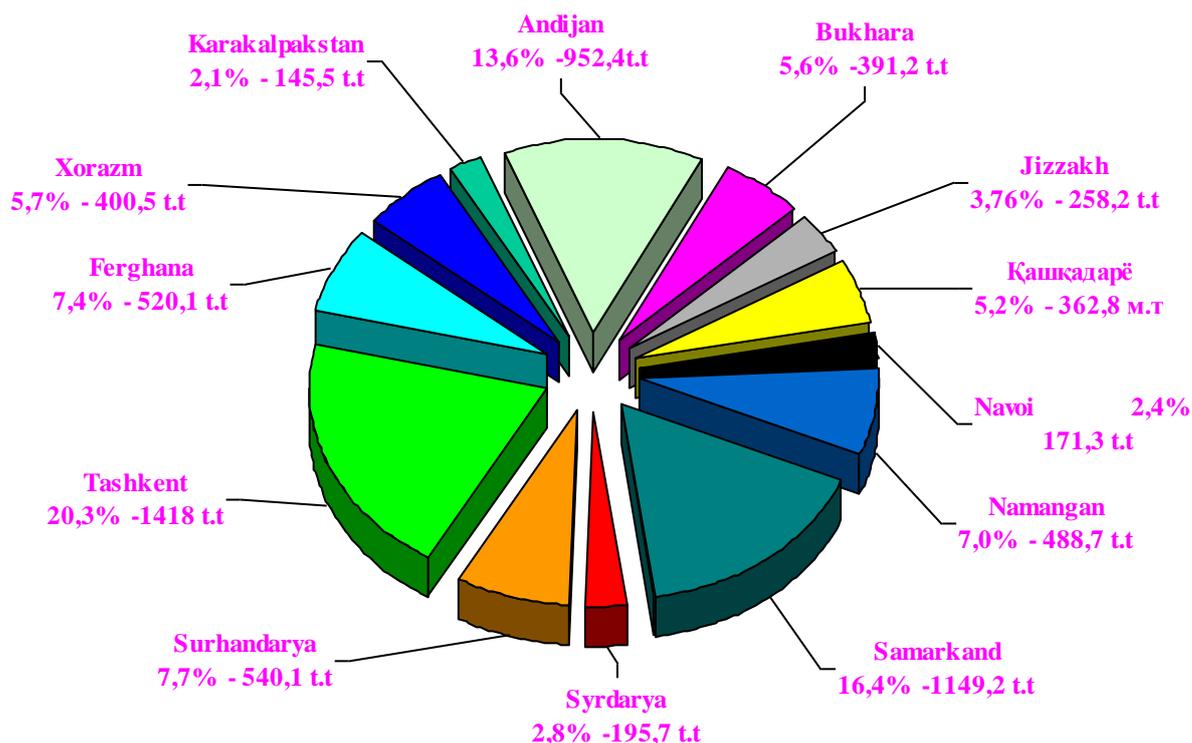
Resolution of the President of the Republic of Uzbekistan from January 11, 2006 of No. PP-255 “About organizational measures for reforming of fruit and vegetable growing and wine growing”, “The World economic crisis and measures of elimination and avoidance of crisis in the conditions of Uzbekistan” it is offered with a view of a raising of a living standard of peasants, farmers to raise the ground area in 2,5 times or from 10 hectares to 24,7 hectares under crops of vegetables and a potato.

In Diagram 3 ground areas for 2006-2011 for vegetables growing, its productivity (centner/hectare) and harvesting are shown (**Diagram 3**).



**Diagramme 3.** The sowing areas, productivity, harvesting of vegetables on Republic for 2006-2011.

The sowing of vegetables is in spring on 230 000 hectares of the land, of potatoes on 80600 hectares, of melon vegetables on 57 000 hectares of the land. It means that production of fruit and vegetables will still rise. In diagram 4 we can see information on vegetable growing among all regions of the Republic of Uzbekistan(Diagram 4).



**Diagram 4.** Results by 2011 of vegetable production manufacture among the regions(thousand ton,%)

Among vegetables, the turnip is considered one of qualitative products of agriculture, and also one of the most ancient cultural plants which people accept in food with pleasure.

For today on Republic for turnip and radish cultivation, 13114 hectares of the ground area where its productivity makes 199 centners/hectare are allocated, and 260 568 tons of yield is obtained. From this 224 521 tons goes to country home

market, 5890 tons are exported, 1513 tons go for processing, formation and health care.

The radish, turnip, radish are rich with carbohydrates, vitamins, fats and etc. Also it helps food digesting in an organism and does not suppose gathering of unnecessary salts in a body of the person. Juice of a radish with honey helps at cough, at rheumatism; many root vegetables have medical properties.

Turnip as vegetable and the herb is known from an extreme antiquity. It is possible to bake, boil, stuff turnip, from it prepare baked puddings and a ragout; it is suitable for preparation of salads. It can be long stored in a cool place, without losing the valuable, curative qualities, an organism easily digests it and it is recommended for baby food. In Uzbekistan, the turnip is used long since.

Owing to the high maintenance of calcium, turnip served as the basic prophylactic, rescuing children from a rachitis, diseases of bones and blood. The plant possesses diuretic, antiseptic, anti-inflammatory, wound curing and anaesthetizing action.

Radish is used in a crude kind, turnip in boiled, stewed, and fried kinds. We, in our final work have collected set of the data about increase of productivity, quality, easy technology of use of turnip. We hope that these data in vegetable growing will help us to raise the qualification.

## Chapter I I. The basic part

### 2.1 An origin and reproduction of turnip and its place in a national economy.

#### *Origin and reproduction of turnip.*

According to many scientists root vegetables appeared on the coast of the Sea Mediterranean Vavilov (1940). Expects the carrots, radishes, turnips have two central places of origin: Mediterranean coast of the Sea, South-West and West Asia.

Japanese scientist Nisiyami I. (1958) described that the carrots and radish in Europe did the ancient Silk way from China and Japan.

Homeland is also turnip West Asia. This is one of the oldest cultivated plants. Turnip was introduction in culture for about 40 centuries ago, radish okolo50 centuries ago, and carrots 30 centuries ago. And almost from that moment many people root vegetables are the staple food for centuries.

The ancient Egyptians, Persians and Greeks widely cultivated turnips, considered by its food slaves and poor peasants. In ancient Rome, baked turnip already used the representatives of all saslovy.

In ancient times, turnips sacrificed god Apollo, bringing it to the temples on the tin dishes.

The Romans succeeded in growing large turnips and cooked many meals. Antique love of reputation was so great that even Gaius Plinius Secundus infringed a significant place in her famous. Natural History he believed, "... there is no plant that would be commonplace esteemed reputation in the distant Middle Ages."

Over time, turnip spread to western Europe. In Russia, turnips since ancient times has been the most important staple food for her, there are references in the ancient chronicles. Even in the distant past, the peoples of Central Asia saw this as

a rare root crops other: feed enough, and will protect against many diseases, and thus prolong life. After all, vitamins and minerals, enclosed in a turnip - a sort of treasure in folk medicine. Great healer Abu Ali ibn Sina paid turnips big place in his works. Ibn Sina wrote: "... What meat is cooked with turnips to treat colds, clears the lungs and soothes the throat. A boiled turnip treat goiter. Eating raw turnip improves vision. "

Healer Yusuf Al-Hirova in his work "On the benefits of good things," said medicinal properties of the turnips and seeds.

Turnips in Uzbekistan has taken a well-deserved place on our dastarkhan, and the use of turnips boiled, steamed and fried forms contributed to the expansion of the diet of our ancestors and us in how many turnips grow easily and quickly dospevaet it - it's properties have made all your favorite turnip truly popular product, providing power to all sections of the population. Repa quite tasty as fresh, and in baked or stewed. Carrots and turnips and roasted stuffed. And it is extremely useful to the body.

Turnips on the content of vitamin C in revenge times the onions. It stores vitamins B1, B2 and B5 (so useful for our inflated constant stress of the nervous system), and sugar is even more than sweet apples. About the bactericidal properties of turnips are known to all and sundry.

For over 600 years turnip has been commonly used as livestock fodder and for most of that time it has been managed as a fodder crop. By the 1970s researchers had begun to demonstrate turnips potential not just as a fodder crop but also as a pasture crop. Caution needs to taken when feeding stock on turnip however as health problems such as thyroid enlargement in young sheep and cattle and anemia in all ages can occur in stock if turnip is not fed in combination with other forages. Furthermore nitrate (nitrogen) toxicity can occur in livestock fed on turnip during the breeding season or after the plants have begun flowering. Finally dairy cows should not be fed more than 23kgs turnip/head/day and not milked immediately after feeding as this taints the milk[14].

H.Burieva (1999) characterized: the dining room and feed varieties of turnip  
Brassica species include L. rapa

In this type consists of 5 subspecies, each species has a characteristic on 38  
varieties of subspecies

Turnips:

1. European (three groups of species)

- 1) The western European,

2) The northern European.

Cold-resistant, form the root of the fruit-rounded and flat, flat, color white,  
yellow raspberry, pink. Contains sugar, vitamin C (21-53 mg%) B1, B2, carotene.

2). Asia Minor subspecies of fruit shapes, small white meat, bitter.

3. The Iraq-has two kinds green headed, painting white and headed sine  
white coloring. They are poorly kept.

4. Center for Asian - Asian, Western Chinese, Afghan and Indian form. Here  
Samarkand and Namangan local spot.

The fruit is oval - flat, slightly hairy, pink or white paint, white meat, green  
assists.

5. Japanese - has a variety of varieties. The fruits are smooth, flat shape,  
round, oblong, white meat, tasty fast will sing. Root crops ripen differently.

a) fast ripe ready to food for 60-70 days.

b) middle-ready-to-eat for 70-90 days

c) late-ready food in 90 days or more.

Turnips are not capricious can grow anywhere, if grown in the cool, the root  
vegetable is tasty, large and quickly cooked. It can be grabbed in the basement,  
cellar storage.

In Russia grow yellow turnip taste, tasty, has the shape of a potato.  
Previously, we have a reputation in Uzbekistan has not grown, bringing together in  
years, we have grown it.

It is thought that the turnip (the temperate type) originally comes from Northern Europe about 2000 years bc when Neolithic farmers were thought to cultivate the round turnips we find today. The Asian turnips (tropical type) origin is unknown though as the name implies it is thought to come from Asia. In about 1500 bc forms of wild turnip were grown in India for their oil bearing properties while in the Middle East and during the times of the Romans turnips were cultivated for cattle fodder(Allardice P, (1993) A - Z of Companion Planting. Cassell Publishers Ltd).

### ***The value of turnips in the economy.***

Turnip is a type of edible root vegetables. The plant comprises a plurality of carbohydrate, nitrogen, vitamins, enzymes, perfumed substances and mineral salts of calcium, phosphorus, potassium, iron, magnesium, and is a useful foodstuff. According to its turnip improves digestion and prevents harmful to collect salt in the body.

Ancient river in Uzbekistan grew and prepared different meals out of it. Local people used it as a disgusting sleeping inflammatory drugs. Turnip contains ascorbic acid, vitamin C, vitamin B1, B2 and B5. Turnip has diet quality and good taste. A.Sazanova, E.A.Vlasova (1990) compiled a table of calories and biochemical composition of turnip (Table 1).

Especially often used turnips in the autumn, winter and spring to prevent colds and flu. Modern scientists have discovered a turnip energy.

French scientists have come to a complete that from 1000 kg of turnip can get 10-120 liter of fuel alcohol.

**Table 1.****The biochemical composition**

1 kg of calories, kJ	126
Water, %	90,5
Proteins, %	1,5
Fat, %	0,2
Sugar, %	3,0
Cellulose, %	1,4
Ash, %	0,7
Carotene, %	0,1
Vitamin C, g %	20
B <sub>1</sub>	0,04
B <sub>2</sub>	0,05
PP	0,8

**2.2. The botanical description, chemical composition and biological properties.**

*Botanical about writing.*

Turnip (Brassica Latin gara).

- An annual or biennial herbaceous plant species of the genus - cabbage (Brassica) family of cabbage (Brassicaceae) or cruciferous (cruciferae).

The root class called turnip.

Scientific classification.

Kingdom: Plants

Department: Angiosperms

Class: Dicotyledonous

Order: Cauliflower

Gender: Cabbage

View: turnip

Latin name: Brassica rapa L., 1753

In the first year grows rosette of basal leaves and fleshy edible root. In the second year (and, if unsuccessful crops and for the same year) of the tuber grows long, leafy stems with flowers.

Square thinning, fleshy.

Stem tall, strong leafy.

The basal leaves are green, lyre-pinnately cleft, hard hairy, long-. Stem leaves sessile, ovate, toothed or goal, but extreme, amplexicaul, bare bottom or slightly pubescent.

Inflorescence in the early flowering of the thyroid (flowers buds above) golden petals:

- Yellow or dull pale;

- Yellow nail shorter limb and sepals. Stamen rejected, long, erect. Peduncle at flowering rejected at an acute angle, with a length of 3-8.

Pods erect, knotty, short, elongated spout - conical, with a pointed object is.

1/4 -1 / 2 length sash. Seeds reddish - brown, not quite correct spherical, with a visible spine.

N.N.Balashov, G.O.Zeman (1977). V.Zuev, A.Abdullayev (1997) T.E.Ostanakulov, V.I.Zuev, O.K.Kodirxujaev (2009), a table index of the quality of turnip seeds (Table 2) .

**Table 2.****Quality score turnip seeds.**

Seeds class1			Seeds class2		
Shoots no less, %	Cleanliness is not less than,%	Mixing seeds no more mass, %	Shoots no less, %	Purity not less,%	Mixing seeds no more weight, %
95	98	0,2	80	95	1,0

Turnips can be green leaves (gear) sessile, ovate, entire extreme, amplexicaul, naked and slightly pubescent. Seeds are small pieces of the 1,000 may weighs 3-4.5 grams. Sejanus germinate after sowing at the 4th-5th day. 15-20 day flowering and flowering continues to 25-30 days(Table 3).

The turnip is a cruciferous tolerate cold and the summer is considered to be the two plants.

Usually turnips need seat in places where previously grown cabbage or potatoes.

**Table 3.****Additional indications turnip seeds.**

Shelf life (years)	seed germination temperature (minimum)	Time seedling emergence (day)	Humidity seed (%)	Weight of the seed weight of 1,000 (g)	Validity period of storage of seed (kg / ha)	Seedlings seeds (%)
4-5	3-6	3-6	9	1,0-4,0	3-5	60

***Biological property:***

According to the description N.N.Balashova., G.O.Zeana (1977)., T.E.Ostanakulova., V.I.Zueva., O.K.Kadirhuzhaeva (2009). Tired, fleshy root turnip is the fruit of it.

During the first bloom - two bushes in the inflorescence is a root vegetable time image shape.

Root has three parts:

1) head 2) throat 3), this root.

Comfort of turnips in early spring as soon as the soil dries. During the summer, you can get two crops. For the winter. It is better to store turnips from the summer sowing.

Pests: crucifer flea beetle and cabbage fly.

***General characteristics***

Turnips are members of the mustard family and it is therefore related to cabbage and broccoli. It is a biennial which generally forms seed in the second year, or even in the late fall in the year if planted early in spring. Turnips differ

from rutabagas in that turnip leaves are hairy and the flesh of the root is white, while rutabagas have large smooth leaves and roots with yellow flesh. The turnip is also a relatively short-season crop while rutabagas will take the entire growing season to mature.

***Leaves (Top growth)***

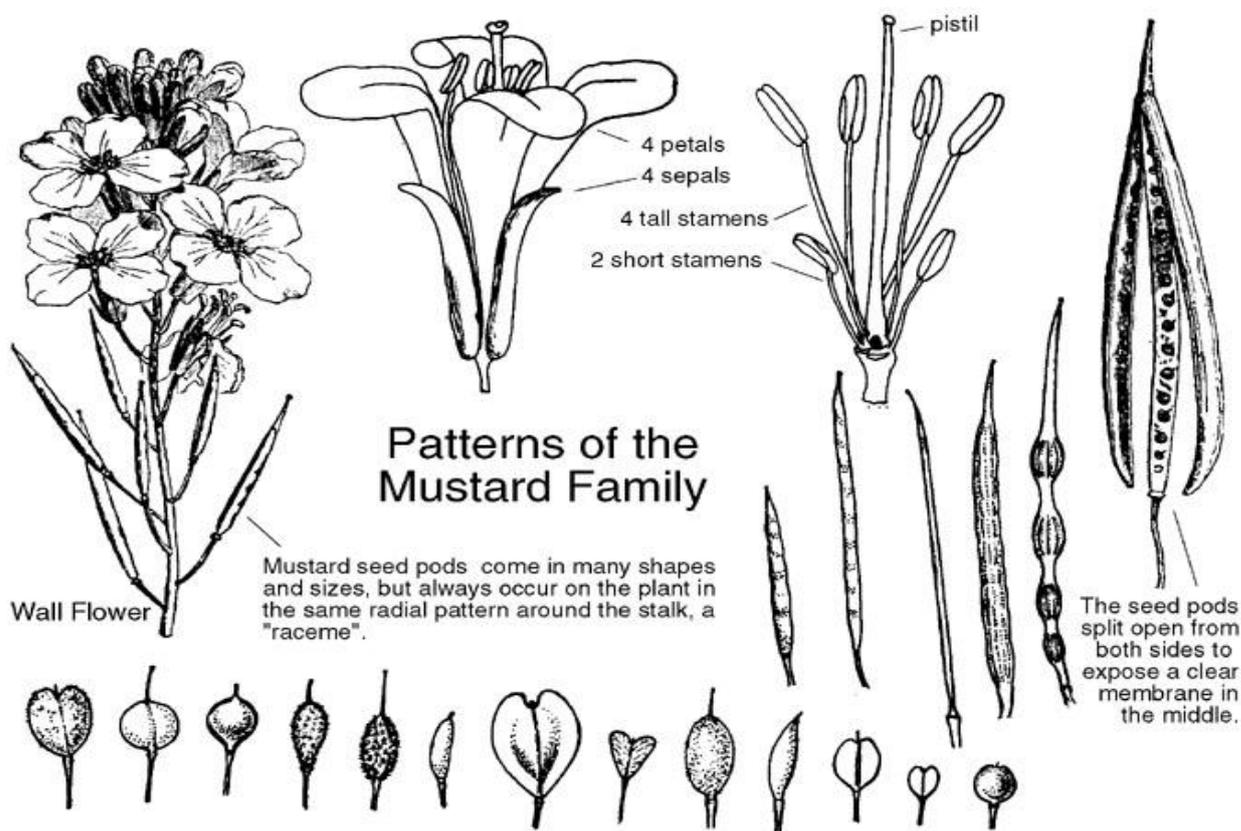
Turnip leaves are generally pinnate or simple leaves that are green, thin and sparsely pubescent (hairy).

***Roots***

The storage root consists mainly of the hypocotyl. The turnip most generally has little or no neck and a distinct tap root. The storage root can overwinter in areas of mild winter or with adequate snow cover for insulation and produce 8 to 10 leaves from the crown in a broad, low-spreading growth habit the following spring

***Flowers***

Turnips produce branched flowering stems with small flowers that are clustered at the top of the raceme and are usually raised above the terminal buds. Flowers are small with light-yellow petals[12].



### *Climate*

Temperature: Turnips are a cool season biennial which is well adapted to cooler or moderate temperatures. Turnips grow best at temperatures between 15-18°C and maximum of 24° and a minimum of 5°C. At high temperatures eating quality of the crop deteriorates and the roots become woody, tough and bitter tasting. Extended temperatures below 10°C may cause some varieties to bolt, which in turn results in a hard root core and an unmarketable crop. Asiatic varieties require warmer climatic conditions than the European types and such are able to be grown earlier

Rainfall: An abundant reserve of moisture is required to guarantee a high quality product. Where irrigation is not supplied then rainfall must be of adequate amount to maintain root zone moisture at or near field capacity[12].

### *Soil*

Turnips are well adapted to a variety of root zones but it grows best in well drained, light soils such as on well-structured sandy loam soils. Turnips do not grow well in soils that are of high clay texture, wet or poorly drained. During a wet harvest the roots pick up less soil if they are

grown in a lighter soil. Turnips grow best in a pH of 5.5-7.0. As with carrots and radishes the shape of the tap root can be affected by hard clay soil, stones, rocks and soil debris[12].

### *Chemical composition:*

The plant contains no nitrogenous compounds (6.5%), nitrogenous compounds (1.1%), fat (0.2%), mineral salts (but a very high content of calcium), vitamins (A, 0.04 g, C r -8-20, Bi-0,08-0, 11 g), a significant amount of sugars and vitamin PP.

In the chemical composition of turnip includes vitamins, carbohydrates, minerals, and a special rare item - glucoraphanin - plant "precursor" of sulfonated,

which has strong anti-cancer and anti-diabetic properties. Glucoraphanin found in almost all kinds of cabbage, but biologically significant quantities it is present only in our beloved turnip and "other" broccoli, cauliflower and kohlrabi.

According to the content of vitamin C turnips almost twice as oranges, lemons and cabbage. But they are considered champions of the content of ascorbic acid. Furthermore, turnips have vitamins A, B1, B2, B5, PP, carotene, potassium, calcium, phosphorus, magnesium, iron, sodium, sulfur, small amounts of manganese and iodine.

By the number of phosphorus ahead of radishes and turnips radish. Turnip includes a set of required human body mineral salts that give it healing properties. Sulfur salts, for example, purified and disinfected blood digested kidney stones, and urinary bladder. They have a beneficial effect in infections, skin diseases and bronchitis.

In turnip is magnesium. Therefore turnip is a preventive measure against cancer. Magnesium, by the way, helps bone tissue to accumulate calcium, which is essential for the development and strengthening of the skeleton, especially in the developing body of children and adolescents. And for the older people who have the bones begin to weaken (and therefore there is a risk of osteoporosis), this factor is of great importance.

The nutritional value of turnips for humans can be summarized as low in fat and calories but high in vitamin C and fiber. In one cup (156 grams) of cubed turnips which have been cooked, boiled, and drained, with no additional ingredients, the following can be found: 146.02 grams of water, 34 calories, 1.11 grams of protein, 0.2 grams of fat, 7.89 grams of carbohydrates, 3.1 grams of fiber, 4.66 grams of sugar, 51 milligrams of calcium, 0.28 milligrams of iron, 14 milligrams of magnesium, 41 milligrams of phosphorus, 276 milligrams of potassium, 25 milligrams of sodium, 0.19 milligrams of zinc, 0.003 milligrams of copper, 0.111 milligrams of manganese, 0.3 milligrams of selenium, 18.1

milligrams of Vitamin C, 0.042 milligrams of thiamin, 0.036 milligrams of riboflavin, 0.466 milligrams of niacin, 0.222 milligrams of pantothenic acid, 0.105 milligrams of Vitamin B-6, 14 mcg of foliate, 13.6 mcg of choline, 0.03 milligrams of Vitamin E, and 0.2 milligrams of Vitamin K7. The root of the turnip is where the Vitamin C, potassium, and fiber are found. The greens have vitamins A and K in addition to the Vitamin C, foliate, and beta-carotene, lutein, and zeaxanthin, which are common antioxidants. Lutein and zeaxanthin have "shown promise in helping combat the eye conditions of macular degeneration and cataracts". In addition, turnips, like other members of the Brassica family, could protect against colon, lung, prostate, and stomach cancers since studies show there is a compound in the vegetables that "induces the death of cancer cells"[13].

Turnips, however, provide different nutritional value for animals. Forage, which is a term used to describe plant material consumed by livestock, is of very high quality in turnips in relation to that of other commonly grown plants. Grazing animals consume the stems, leaves, and roots of the plants. The stems and leaves contain about 20-25% crude protein, 65-80% in vitro 5 digestible dry matter, 20% neutral detergent fiber, and 23% acid detergent fiber; while the roots contain about 10-14% crude protein and 80 -85% in vitro digestible dry matter. Similar to the effects of corn on cattle digestive systems, turnips can lead to health problems if an animal is fed just that for too long. As Barbara Pleasant says in a 2007 article about the benefits of turnips for human consumption, "No other vegetable gives you the choice between super nutritious greens or juicy roots that rival carrots for crunchiness ... [that have] easy to store perfect roots". These plants have unlimited uses due to their multiple edible parts, and their nutritional benefits are of great value to both humans and animals[12].

### ***Turnips and Hybrid Turnips***

Turnip roots, stems, and leaves are palatable to livestock . However, livestock can become sick if they are allowed to eat too much turnip too quickly, especially if they are hungry when first fed turnip leaves or roots. If livestock are subsisting

on forage with low nutritional quality, gradually insert high quality feed such as turnips into their diet in order to build up healthy rumen microbial populations that can break down protein. When grazing turnip leaves, livestock should have access to hay or other pasture. Additionally, lower quality hay should simultaneously be made available to provide animals with adequate amounts of fiber.

As with rutabaga, turnip forage is high quality, similar to concentrate feeds, due to high total digestible nutrients and crude proteins. Similar to rutabagas, turnips contain glucosinolates which suppress thyroid function. If livestock are subsisting largely on turnips, they may need iodine supplements to counteract the thyrotoxic effect of the glucosinolates (Undersander et al., 1991; Lewis, 1998). Glucosinolate content is higher in older (90-day) turnip forage versus younger (60-day) forage. Furthermore, dairy cattle should not be fed turnips during their breeding season or after turnips flower because of potential problems with nitrate toxicity when plants are immature or soil nitrogen is Feeding rate. Turnips, like other root crops, have high moisture content, thus they help to increase milk flow in dairy cows and ewes. Dairy cows should not be fed turnips on an empty stomach or in excess of more than 22.7 kilograms per day, as turnips can give a “turnipy” odor to the milk. Up to 4,5 kilograms per day of turnips may be fed to horses; 2,2–3,6 kilograms per day prevents indigestion[14].

Turnips were historically used as the main winter fodder for brood sows. Turnips can be fed whole to pigs but should be chopped up into smaller pieces for cattle and sheep that are susceptible to choking on whole roots. Current farmers’ experiences suggest different types of animals may not readily feed on turnips. It is thus advisable to grow a small amount in the first year to determine if your livestock will eat turnip. It may take time for some livestock to become accustomed to eating turnips.

Turnips may also be grown as a forage crop for grazing. With a short grazing rotation, turnip fields may be grazed up to four times. If grazed twice, roots may still be harvested. If grazing rotations are too long and livestock consume the tops

entirely, then the livestock will begin to consume the roots. Many of the modern varieties have been bred with a smaller root system, allowing for multiple grazing events and rapid re-growth.

*Production.* Like rutabagas and fodder beets, turnip roots consist of a modified hypocotyl, primary root, and tap root. The hypocotyl and primary root store most of the carbohydrates. The taproot can reach quite far but is usually broken partially or entirely broken off in harvest. Turnips develop an extensive fine root system relatively quickly. Three-week old plants have been found to have

The leaves form a rosette, are grass-green in color, and have sparse coarse hairs. Turnip is a biennial which generally produces seed its second year in the field.

*Root types.* There are five turnip shapes recorded: long, tankard, round, globe, and flat. Currently, most varieties are globe shaped. The long type is at least three times as long as wide and the primary root tapers gradually into a tap root. The tankard type was valued for its uniformity, with parallel straight sides, slightly oblong in overall form, and tapering abruptly into a tap root. Round types are uniform and tend to sit at or above the soil surface. Globe types are nearly spherical in form and the root remains below ground much more than tankard or long types. Thus, globe types tend to be more frost hardy. Flat types are similar to globe types but develop greater width than length, thus a large amount of the root remains exposed above the soil surface.

*Varieties.* Historically, popular turnip varieties were selected for large roots with good keeping qualities. Today, two types of turnips are grown for livestock fodder: turnips with optimal root development and turnips with a high leaf to root ratio for grazing. Turnip root cultivars can be categorized into two groups: white-fleshed varieties and yellow-fleshed varieties (Ware and McCollum, 1980). The outer skin can range from white to green to purple. Today, turnips are most widely cultivated as a vegetable crop and there is a wide selection of available varieties. Vegetable breeding programs tend to focus on small tender roots and vigorous leaf

production. While these varieties can be used for livestock fodder, they do not produce maximum yield as compared to older fodder varieties[14].

*Hybrid turnip.* The first hybrid turnips documented as far back as 1844 were a cross between a green-topped rutabaga (swede) and a globe turnip, with either yellow or white flesh. This hybrid was developed to combine the cold tolerance and greater amount of dry matter of rutabagas with the faster growth and maturity of turnips. Hybrid turnips should be grown following the same recommendations as for turnips.

Historic hybrid turnip varieties appear to be independent from the more recent Japanese hybrid varieties developed for human consumption in the 1950s. Current turnip hybrid breeding programs are led by private seed companies seeking to hybridize turnips with other cultivars and species for a wide variety of vegetable characteristics, including high quality leaf production, tender root texture, lack of leaf pubescence, and general uniformity. The focus of these vegetable breeding programs shifted the characteristics of turnips away from large root size and long-term storability to qualities such as refined taste for humans.

*Soil characteristics.* Turnips are more tolerant of a greater variety of soil types than other root crops such as beets and carrots. They thrive on moist well-drained, slightly acid sandy loam soils and loam soil with a pH range of 5.5–6.8. In the Pacific Northwest, good soil drainage is required for fall and winter turnip production. Soil should ideally have good amounts (> 3.0%) of organic matter (OSU, 2004).

*Seeding.* Turnips can successfully be sown into pasture ground with minimum tillage if pasture crops are suppressed to allow young seedlings to compete.

Turnips do not germinate well under cold soil temperatures. For spring crops, sow seed when soil temperatures have reached at least 10 degrees Celsius. While turnips are cold hardy, they do not withstand frost as well as rutabagas. For mid-summer harvest, sow seed in late May or early June. Once soil temperatures are warm enough, seed up to 70 days before the first hard frost. Plant between July 20

and August 1 for fall harvest There is an old adage, “On the twenty-fifth of July sow your turnips wet or dry” which may still provide good guidance regarding last planting dates.

*Cultivation.* The first and second cultivation for weed control may be relatively deep but succeeding cultivations should be shallow to avoid damaging roots. Do not cultivate more than four times. Once turnips become established, they are able to compete with most weeds.

*Pests.* Two types of flea beetles, the cabbage flea beetle (*Psylliodes luridipennis*) and the striped flea beetle (*Phyllotreta striolata*) feed exclusively on Brassicas and attack the cotyledons and first true leaves, causing extensive loss to turnip crops. Turnip louse (*Aphis brassicae*) and aphid (*Lipaphis erysimi*) can also be problems, but aphid-tolerant cultivars such as Forage Star have been developed. Crop rotation will help control diseases. To avoid pests, do not grow turnips in soil that was used in the previous 4–5 years to grow root crops or Brassica crops. Rotate turnips with clover, beans, peas or grain crops (Duke, 1998).

*Yield.* Turnip greens grown for forage will yield 3–4 tons of dry matter per acre. A good average yield of turnip roots is 37,5 tons per hectare.

*Harvest.* Roots may be harvested 45–80 days after seeding. Turnips are frequently pulled by hand, but beet lifters can be used for lifting and topping the roots. If turnips are being grown for forage or green chop, they should be harvested when leaves are 30.48 centimeters tall, approximately 70–90 days after planting[14].

### **2.3. The characteristic of turnip grades on areas of Uzbekistan**

Varieties of turnips "Muyassar", "Namangan mahalliysi" and "Samarqand mahalliysi" about the district of Bath and approved by the National Register of agricultural crops in the regions of the Republic of Uzbekistan.

All these varieties are early maturing and ripening for 60-70 days. Sort Namangan local localization in Andijan, Jizzakh, Samarqand and Tashkent areas, "Samarqand mahalliysi" localization in Andijan and Namangan regions.

According to its T.E.Ostonakulov, V.I.Zuev, O.Kadirxojaev (2009) about the areas in Uzbekistan and widespread varieties "Muyassar", "Namangan mahalliysi" and "Samarqand mahalliysi".

"Muyassar" - the quick sort. The leaves are oval, round, large, not hairy, smooth. Root round, the color is white, medium-sized, juicy, tender. Productivity - high (100-120 kg / ha).

"Namangan mahalliysi" - early maturing variety. Root small, flat shape, juicy, sweet, do not peel is smooth. Colouring mostly white, and yellow may be. Average yield (70-80 t / ha).

"Samarqand mahalliysi" - middle-grade. Root large, flat or oval - flat white paint, too locally solid if grow to become a tree, peel the vertical, the average yield (70-85 t / ha)

These varieties are approved by the state registry of Agriculture of the Republic of Uzbekistan.

## “Muyassar”



Created by Institute of vegetable, melon Uzbekistan in cooperation with Surxandaryo test points.

Authors: B.T. Turdikulov

Aramov. H.

Bunin. C.

Since 2004 the state approved roster of planting throughout the country. Quickly mellow variety, oval leaves, smooth ones. Root medium size with a diameter of 6-7, round, pharynx, juicy white coloration.

Yields in 2002 in Tashkent test point at 32.5 tons in Bukhara test section 34.2 tons. Root weighs 102 g., The taste of 3.8 points. Contains 28.3 g of vitamin C% nitrate 246.7 g / kg dry substance 6.8%, sugar 3.2%, proteins 1.0%. Term maturity of 71 days.

## “Namangan mahalliysi”



Variety of national selection in 1949 entered into the State Register in Andijan, Namangan, Ferghana and Tashkent regions. Quickly ripe variety. Leaves toothed, green, smooth. Root oval flat white paint, has a lot of lateral roots are fully covered with soil.

Yields in 1987-1988, Ordzhonikidzevskya test site was 41-42 t / ha of root vegetable weighs 138-140 g., Juicy taste of 4.5 points. Term ripened 54-60 days.

## “Samarqand mahalliysi”



Variety of national selection 1949 Andijan, Namangan region was the State Register. Ripening varieties. Leaves toothed, hard, dark green color. Root oval flat, color raspberry pink, white and fleshy.

Yields in 1987-1988 in Ordzhonikidze test point was 32-34 t / ha. Root weighs 124-130 g., The taste of 4.5 points. Deadline to eat 53-55 days. In unfavorable conditions, a root crop farming can become as hard as wood.

## **Chapter I I I. Technology of turnip cultivation**

### **3.1. A choice and preparation of soil for crops**

Under the turnip withdrawn sunny areas with fertile soil where manure before and not after cabbage, radish, radish. The soil should be light and sandy. But beets can grow in clay soil and will give a good harvest.

On clay soils of the river is usually ill salt, and it turns woody root vegetable taste good. It can be a precursor of cucumber, tomato, potato. Best predecessors - it's early cultures obtained organic fertilizer.

Can not be earlier than in 3-4 years place reputation for cabbage and other cruciferous vegetable crops. On the growth and yield of good action has wood ash. By neutralizing the acidity of the soil, ash protects plants from diseases and provides saltpeter, phosphorus, calcium and trace elements. Ash is possible to plot for distillation in an amount of 1 - 1.5 kg/10m<sup>2</sup>.

Root vegetables are not advised to plant where the predecessor was the onions, since this soil is a lot of weed. Root vegetables crops in Uzbekistan is usually put in place early ripening summer and fall vegetables in place of harvested wheat.

Just precursors can be rapidly ripe vegetables, such as cucumber, tomato, cabbage this summer and early fall after the grain (wheat).

Root vegetables grow very slowly, for this reason, they may overgrown with weeds. Summer turnips are planted as a second crop harvest after harvest of early potatoes. Turnip is well fed with chemical fertilizers, gives a good yield in the light of uncountable soil.

#### ***Training seedbed.***

To prepare the ground for sowing in autumn plowing plows her MO-4-35, IL-3-35 to a depth of 3-3,5. Equate field and loosen. According to the description T.E.Ostonakulova, V.I.Zueva, O.K.Kadirhuzhaeva (2009) after the harvest

predecessors, they plow the soil, clean the roots of weeds and loosen equate. Turnip seeds are very small, do not require a deep planting. So it must remain uniform surface friability.

When ready the soil, it should be lightly watered to moisture. There could be green it must be harrowed. The best for the kitchen garden is an open flat area with a slight slope. It should be well illuminated during the day and the sun is not obscured by trees or buildings. The areas protected from the north and north-east side of the vegetation or buildings, most suitable for growing early vegetables. Good for growing vegetables are considered floodplain and drained low-lying land. Ground water must not lie closer to 1.2-1.5 m above the ground.

Lowland acidic soil in which grow horsetail and sorrel, easy to improve and make fertile making freshly slaked lime at the rate of 50-100 kg per 100 m<sup>2</sup> area. On light soils, slightly acid and lime give less, and on heavy clay - more. Make lime every 3-4 years. Do not make it directly under the potatoes, as it contributes to shock scab. It is better to make lime for vegetable crops. When applying manure and lime at the same time, you must first dispel the kitchen garden lime, and then scatter and added dropwise or manure.

Especially require liming soil cabbage, beets, garlic, lettuce, spinach, celery, carrots, cucumbers, beans, turnips, rutabaga. Less demanding of him radish, radish, squash, tomatoes, sorrel. Adding lime for cabbage and other cruciferous both a prevention against the disease of kaya.

In some areas, especially in the south, common salt-alkaline soils, which do not grow vegetables and potatoes. In order to increase their fertility must for every 100 m<sup>2</sup> of space to make the fall plowing 10-30 kg ground gypsum. After the gypsum area, if possible, should be watered in the winter - to snow retention. With the combination of gypsum with organic fertilizers and agricultural technology high salt licks turn into fertile soil.

*Fertilizers and their use.* Apply organic, mineral, bacterial, and micronutrient. For organic fertilizers include manure, humus, peat, organic municipal waste,

various composts, liquid manure, bird droppings, feces, organic-mineral mixes, etc. It contains all the essential nutrients necessary for plants. The most valuable organic fertilizer is manure. It contains an average of 76% water, 22 - Organic substances 0.6 - N 0.8 - Potassium 0.3 - 0.3% of phosphorus and calcium.

Manure compared to fresh weight decreases by 20-30%, and the mold is no more than 25% of fresh manure.

Pond and river silt can also be used as fertilizer for vegetable crops. This is harvested as the level of water in the pond and taken to the garden. It contains 6-30% humus, 0.25-2 - nitrogen 0.2-0.8 - 0.25-0.50% potassium and phosphorus. Slurry used in horticulture plant nutrition, diluting it with water in a ratio of 1:5-6. Carried out after pre-dressing watering plants with water the day before fertilizing. Nitrogen and potassium fertilization of the plants used by 60-70%.

#### ***Feeding of turnip fertilizer.***

When growing turnips are more desirable fertile soil. Under its cultivation make humus or compost - up to 4 kg / 2 and 15-20g of superphosphate and potassium salt for getting a good yield in our conditions.

Turnips are fertilized than 1 sowing fertilizers to obtain yields of 150-200 centners should fertilize normally kg / ha: 120-150 nitrogen, phosphorus 80-100, 40-50 potassium. Phosphorus fertilizer is given in the first two (25-30%) before planting turnips. Also, for the entire period of growth turnips 2 times given nitrogen fertilizer: 1) before running through the germ has 2-3 leaflets, and 2) a second time fertilize after 20-25 days from the image of your form fetus. On the basis of where planted turnips, to get rid of weeds and unwanted plants per 1 hectare of herbicide 40-45 kg.

Premature redemption of turnip weed is the method: Before planting, the soil is treated with herbicides and cultivate depth of 10-12 with only a donkey that sows turnips.

Mineral fertilizer according to what nutrients included in their composition, divided into the following groups: nitrogen (ammonium nitrate contains 34-35% nitrogen, ammonium sulfate - 20,5-21, urea - 40 15.5 calcium and sodium 16-16,5% nitrate nitrogen, etc.), phosphorus (superphosphate contains 14-19,5% phosphorus, triple superphosphate 37 - 54 complex - ammophos to 50% of phosphorus and 11-12% nitrogen, DAP - 53 of phosphorus and 20 - N), potassium (potassium chloride comprises 58.1 - 62% potassium sulphate at least 48% of potassium, and in addition, 1% magnesium, potassium nitrate, 44% potassium and 13% nitrogen); magnesium fertilizers (Dolomite flour contains 20% to 28% magnesium and calcium).

Now, more produce compound fertilizers, which contain all the basic elements of nutrition. An example would be the crystals - complex fertilizer, fully soluble in water. Release it six species based on different content and ratio of nutrients (nitrogen, phosphorus, potassium).

Valuable local fertilizer is ash from the combustion of wood, straw, sunflower stalks, peat and other fuels derived from plants. It is used often as a potash fertilizer. Ash contains all the batteries other than nitrogen.

### **3.2. Terms of seeds sowing, preparation of seeds for crops and kinds of crops.**

According to the climatic conditions of Uzbekistan is divided into three bands (region): the southern, central, northern. In connection with this, each band has its time of sowing. Thus, the Northern band sow turnips in mid-July, the central band sow turnips in late July, early August, and the southern strip sow turnips from August 10 to August 20. Harvest in October and November before the cooler. (H.Buriev., V.Zuev., O.Kodirxujaev., M.Muhamedov 2002) (Table 4)

**Table 4.****The term, scheme and turnip seeding rate in Uzbekistan.**

Areas (region)	Period of seeding	The process diagram sowing (cm)	Seeding rate (kg / ha)	Planting depth (cm)
The Southern	10-20.08	$\underline{50+20} \times 10$ 2	2.0-2.5	1-2(3)
The Central	25.07-10.08			
The Northern	15-20.07			

So in Uzbekistan turnips sown in July to mid-August and harvested from November 15 to December 10 (T.E.Ostanakulov1997). Root vegetables are planted in the fields (in the garden). If Russia has its plant in the spring, the decree in Uzbekistan put him in the summer. Sow in mid-July to mid-August.

***Preparation of seed to planting and sowing seeds.***

Seeds are planted turnips not about urinary. Turnip seeds are very small, sow them is not easy, and it is desirable, they are mixed with sand (to grow evenly.)

Before sowing, seeds should be about the dredging that they swelled to a diameter of 3-4.

Usually sow them one line or two to scribble with 45 cm row spacing turnip seeds are very small, so they are thrown at a shallow depth of 1-2 seconds. the normal amount of seed for sowing - 2g per 10 m<sup>2</sup>. On 1m<sup>2</sup> can be planted no more than 40-50 hives. Yields for this are 1 to 3 kg m<sup>2</sup>. Root vegetables can be

consumed by 60-70 days with a diameter of 6-8 cm Store turnips in the basement, cellar storage. This description is straightforward for the farmer households.

Farming put another tape, one-line, two lines and scattered. The fruit grew larger, the distance inter-row spacing of 60 cm, or 50 20/10 2x2 cm must be observed (Table 5).

**Table 5.**

**The term, scheme and turnip seeding rate in Uzbekistan.**

Areas (region)	Period of seeding	The process diagram sowing (cm)	Seeding rate (kg / ha)	Planting depth (cm)
The Southern	10-20.08	$\underline{50+20} \times 10$ 2	2.0-2.5	1-2(3)
The Central	25.07-10.08			
The Northern	15-20.07			

Maintained at a certain distance prorate. With this crop can put the 300-400tysyach seedlings per hectare. Seeding rate on 1 hectare of 2 kg. In order to use the seeder sowing turnips SKON-4, 2; CMM-4 Crops are harrowed to seedling emergence, loosen the aisle, plants fed and watered (in dry weather).

In terms of planting, the turnip is a relatively flexible species. Turnips are easy to grow and may be planted either in the spring, late summer, or the fall if the roots and greens are what is desired from the harvest. It all depends on when the turnips are to be used. For summer use or consumption, one should plant the turnips in the early spring. For fall use, summertime is when the seeds should be planted. Like other plants, much water must be used in order for the seeds to

germinate and the plants to grow to be strong. However, turnips do have some specific cultivation requirements if the planter hopes to get the best output possible.

The soil used for planting the turnips should be not too wet but not too hard. Fortunately, turnips can be grown in any soil, but the loose soil will allow for the roots to develop properly. The soil must be very deep as well, since the roots will reach far down. The pH level should be between 6.0 and 6.8, but the turnips will be able to grow in anything up to level 7.5. Depending on the season the plants will be grown in, the gardener will find different options for light and temperature. Some believe the optimal temperature for growing turnips is between 16 and 18 degrees Celsius, yet others only specify the importance of having "full sun" shine its light on the crop. In all cases, the turnip should take between 40 to 80 days to mature. Turnips should be planted at least two inches apart, to again allow the roots ample room to develop in the soil. If the plant is used for its roots, it should be planted between 5 and 15 centimeters apart, and if for its greens then between one and four inches apart. Approximately once a week, the gardener should use one of many varieties of irrigation methods to give the plant 3.81 centimeters of water by depositing it into the soil. To limit disease and crop failure, the turnip should not be grown after another root vegetable, which is a broad category that encompasses potatoes, beets, carrots, parsnip, and jicama. If root vegetables are grown one after another, this may promote disease. Another way to prevent the spread of diseases in soil is by using hot water treated seed and fungicide treated seed.

If planted correctly, seeds will begin to sprout after three days. If watered too much, the seeds will begin to flower too early, which is not desirable because the root will not have had adequate time to fully develop. Greens will be ready to harvest after between five and seven weeks. In order to continue the plant's development, the gardener must pick only a few leaves from each plant so that the plant and root continues to develop. A few weeks later, the roots will be ready to remove from the soil. However, the turnip roots should be left in the ground as

long as is possible as long as the soil isn't in danger of freezing. If more than needed is picked, the turnips roots will stay fresh in the refrigerator for a few weeks and the greens can be frozen for even longer.

### ***Depth of sowing seeds of turnips.***

Of great importance for obtaining high yield has a uniform arrangement of seeds in the soil depth. If the seed is not in the right depth (meaning on the surface) is the lack of box disappears and will not sprout. But if the seed is also rot and not germinate. Turnip seeds planted on a shallow depth of 1.2 cm to 3 cm in light sandy Dedicated. (H.Buriev., V.Zuev., O.Kodirxujaev., M.Muhamedov 2002).

According to the descriptions root vegetables sown one-line, band, widely line. Distance aisles 60 cm single-line, two-line circuit 50 +20 cm / 2 x 10 cm sow.

Root vegetable crops sown planter for vegetables brand SIS-4, 2. In Uzbekistan, for one hectare of land sown 2-2.5 kg of seed in the depth of 1 cm to 2 cm and 3cm

### **3.3. Care of plants.**

Caring for vegetables is hard work. Immediately after the emergence of seedlings cultivated mechanism CDF-4, 2, SCC-4, 8, SCC-2, 8. about the river spend 12-15 days after germination. Leaving a distance of 2-3 cm. And after 7 - 10 days of repeated thinning leaving between 8-12 cm in prorate possibly removed in the first place and leave the weak strong, good development of the plant.

Belated cultivation and thinning greatly reduced yield and its quality, as plants oppress each other. Thinning can be done, mechanization, and the rest by hand. (H.Buriev., V.Zuev., O.Kodirhuzhaev., M.Muhaedov 2002). We can not allow the slightest thickened plants.

### ***Irrigation (water exchange).***

In the absence of rains should be spent watering 20-30 l/10m<sup>2</sup> (peasant farming). For Uzbekistan FIR climate turnips watering is required. Culture should be covered with water, and enough of it. And not yield decrease and the quality will not be that. Water exchange involves four main processes plant water uptake from the environment, transit through the body of water plants release water and water absorption. Irrigation has its peculiar period.

Prior to the emergence of seedlings should be watered frequently during the 3-4 days after plant trees and shrubs watered 8-10 days time, then 19-15 days. From sowing seeds until ready to eat roots, turnip watered 10-12. Pour until germination is often 3-4 times of the day, after a full germination time 8-10 days, 12-15 days until it is ready again. It should be the proportion of humidity field in comparison with the humidity forecast is 60-75%. Finally, stop watering for 2-3 weeks prior to harvest. Norm watering 500-600 m<sup>3</sup>/ha. In the growing season turnips sprinkled between 8-10 days, 5-6 times during this period, standard irrigation 500-600 m<sup>3</sup>/ha. During the growing season turnip watered 5-6 times with intervals of 8-10 days, the food is equal to 500-600 m<sup>3</sup>/ha. (A.I.Nuriddinov, A.B.Bokitev, I.S.Bakuros (1987)) (table 6)

**Table-6**

### **Irrigation and irrigation ratio of the turnip in Uzbekistan.**

Areas (region)	The number of irrigation (times)	Irrigation interval (days)	Water rate (m <sup>3</sup> /ha)
The Southern	6-8	7-9	600
The Central	5-6	8-10	500
The Northern	4-5	9-11	400

If the location of the area in the wet climatic region that watering is reduced to 8.6 times for the period. Turnip loves to feel thirsty. The lack of moisture roots stiffen, become bitter and unpleasant smell. True waterlogged turnips also rejects.

***Control of diseases and pests (crucifer flea beetles and cabbage fly).***

To achieve the production of high quality vegetables, you need to deal with disease and pests. One of the reasons that turnip not "grows". On young shoots turnip whole hordes of ravenous snatch crucifer flea beetle. To combat these pests using BI-58-(05-1,0 l / ha), karbofos (0.6-1.2 l / ha) benzofosfat (3.3,5 l / ha), which gives a nice effect. Also, these drugs can be consumed in the control of the cabbage fly (T.E.Ostonakulov., V.I.Zuev., O.K.Kodirhuzhaev(2009)).

The fight against disease Gangrened, Fusarium use sulfuric acid and lime 1-1 (15-20 kg per hectare) and are pollinated by a mix can be prepared (suspension) 1% suspension sulfuric acid. Chemicals also help tilt, Topaz-100, Vectra 0.3-0.4 liters per hectare. Pest control is more effective pollination agents dettsis, Ambush, tsimbush, karate, sumi alpha 0.3-0.5 liters per hectare.

A simple dehkanov can use for pest control method is the use of large amounts of ash and protection of landings from crucifer flea beetle, , cabbage fly cover material.

*Crucifer flea beetle* damage the plants in the phase of germination and seedling. These are small beetles overwintering in the soil, in the areas under crop residues, in the crevices of greenhouse frames. In the spring, depending on weather conditions, they are coming out with wintering grounds in late April or early May. First, weed eat cruciferous plants, and then move on to the cabbage. The greatest harm is applied to the dry sunny weather. In cold, wet weather, they are hidden under the ground or lumps under the underside of the leaves. Fleas feed on leaves, gnawing upper layer fabric which leads to the formation of ulcers. Expanding the leaves in the sites of ulcers develop holes. In the mass appearance of flea beetles

damage done to their plants, leading to the death of seedlings and sprouts. Mature plants are hardier damage crucifer flea beetle.



To successfully combat this pest of cabbage, consider the following:

- Early sowing and transplanting into the ground beetles reduce harm, because by the time they become mass plants have time to mature.
- Fertilizing plants nitrate and liquid manure, accelerating their growth, increases resistance to damage cabbage flea beetles.
- Seedlings and mature plants before tying of head should be dusted with DDT dust or a mixture of DDT and 12 percent hexachlorane rate of 12-15 g per 10 m<sup>2</sup>. In the absence of dust can be used in a mixture of sodium silicofluoride with furnace ash and road dust (1:1) at the rate of 10-12 g per 10 m<sup>2</sup>. First carried out when a dusting beetles, second and third - at intervals of 5-7 days.

- Seedlings and mature plants can be sprayed with chlorofosom - 100-200 mg per 1 liter of water.

*Cabbage fly* is particularly strong early damage collard and cauliflower. In appearance, cabbage fly like an ordinary housefly, only somewhat smaller.

Mass years and cabbage root fly egg-laying begins in late May - early June. The fly lays eggs in the soil at the root collar of the plant or to the root collar in small groups - 2-3 eggs. After 8-10 days from eggs white grubs that damage the roots of cabbage: gnaw them to the surface and then vyburavlivayutsya inside the root and eat away its core. Struck by root rots, diet plant is disturbed, it lags behind in growth and dies. Signs of damage to the cabbage fly: taking plants in dry hot sunny weather and staining the lower leaves are bluish-lead color.



To combat the cabbage fly to:

- seedlings dusted once a week with DDT dust, or 6 per cent Dostum hexachlorane, or a mixture of DDT. and 12 percent hexachlorane (1:1 ratio) based on the frame of 3-5 g, or 2-3 g per m<sup>2</sup> nursery.

- After planting the seedlings in the ground 2-3 times (at intervals of 7-8 days) pollinating the plants are the same drugs at the rate of 18-20 g per 10 m<sup>2</sup>.

- Apply (detection of larvae) watering the soil solution at the root of 30 percent thiophos a concentration of 0.03%, spending per plant 250 g of liquid.

- Water the soil under the root of a solution of 65 percent chlorophos concentration 0.15-0.3%, the rate of application of the solution - 200 grams per plant.

In the absence of poisons ground around plants to repel flies sprinkled naphthalene previously mixing it with sand in the ratio 5-8 parts of sand and 1 part of naphthalene used instead of naphthalene tobacco dust is mixed with an equal amount of lime (300 g of 10 m<sup>2</sup>). You can also soak creolin peat litter (200 g in a bucket of peat), and sprinkle around the plants.

### **3.4. Harvesting.**

Harvesting turnip goes by region: in the center of his polo removed at the end of October, beginning of November, the southern strip of the republic was removed after 2-3 weeks, compared with the central strip and the northern strip for 2-3 weeks before over the central strip. Vintage should gather before the cold weather and rain dig harvest, sorted, and transported packed that at this time the fruit should not be damaged. So how badly damaged the fruit store.

At the root the fruit is cut from the tail at a distance of 2 cm cut off the fruit by twisting the canvas in a long time is not stored. Root values are sorted by size, damage. Yield can be dug by the mechanism SNU-3, 6-SNSH 4 SNA 2M OPKSH-1, 4, MMT-1. Also shearing machine KIR-1, 2 or LPP-3A can cut the

leaves, then dig up the fruit mechanism digging potatoes. Or after cutting the leaves in the use of ACS-1.4 for digging onions. (A.I.Nuriddinov, A.B.Bokiev, I.S.Bakuras (1987) (H.Buriev., V.Zuev., O.Kodirhuzhaev ., M.Muhamedov 2002).

After the collection, sorting and transportation. Turnip root crops are stored at a temperature of 0 to 200C humidity to 85-95% in the basement, stored, warehouses or trenches. Also submitted to the market for sale. To store cooked turnip trench width of 50-60 cm, a depth of 70-80 cm Root stored until April in the trenches, and then they are transferred to warehouses or in stacks of up to 1 meter. Root vegetables are packed in boxes and then in containers mechanisms.

### **3.5. Cultivation of turnip for seeds.**

According to the descriptions T.Ostonakulova, VI Zuev, DC Kadirhuzhaeva (2009) for the establishment of root crop seed sowing seeds in the summer.

For this assiduous courtship of sowing: thin fertilize especially in the use of nitrogen fertilizers have to be careful. Root crops grown for seed dug in November before the cold weather. Root vegetables are sorted by: the value of the average weight of 90-120 grams, look for the right color and coating. Small, damaged, burst, cut, withered roots do not are suitable for the formation of seeds. On that after jumping, screening immediately transported to the storage roots.

Harvest turnip seed, seed that date should be enough for sowing 3-4 hectares.

During combos spend approbation. ACT also spend a fall and spring term of the choice of root crops for seed production.

#### ***Selection soil.***

For sowing the seeds of a turnip, take 3-5 years where the soil is not planted edible root vegetables. Also, the soil is free of weeds so that the land would be in the 600 - 2000 meters away from other fields.

#### ***Fertilize.***

Root for the seeds need manure and phosphorus fertilizers. Therefore, before (seeding) seeded fertilize ahead 30-40 tons per hectare of manure, 3.0-3.5 c super phosphate. During the growth of 1.5-2.0 per hectare make cwt. superphosphate and 1.0-1.5 p. ammonium nitrate

***Sowing time.***

Root vegetable seeds for planting in early spring February-March or late fall in November. Autumn sowing gives the highest seed yield than sown. Since the spring can obstruct the growth of various plants.

***Planting method.***

Planting turnips or 60x60 cm in length by 70 cm, 35-40 cm, grouped by the fall in the 12-15cm, the spring in a 5-7cm depth.

***Sitting.***

Over the entire period of weeding 1-2 times, to remove weeds, watered 5-7 times, to fight against diseases and pests. Before flowering to ACT test grade.

***Gathering.***

Ripe seed washed away and have light yellow and brown. In this combos at 50% of the pods have to collect the seeds. Plants with seeds mown or uprooted 8-10 days, it is dried and then threshed.

Dry chips thresh threshing machines of the brand MO-700, MS-1100, and then choose the seeds of machines SS-0, 1, or OS-4, 5A, use clean something "Triumph". Seed yield per hectare be 3-4 quintals. The seeds are stored in dry, ventilated area. Turnip seed should be planted at a distance of 2000m. From the open fields of Chinese cabbage, rutabaga, turnip rape, colza and must be isolated by 600 meters of private fields.

Seeds small turnips, 1,000 are 1-2gramm weight. 500 000-1 000 000 units make up 1 kg of seed cake. Seeds globular, round red-brown color.

As for the quality of cleanliness turnip seeds are divided into three classes: I grade - 98% purity, II grade - 95% purity, III grade - 90% purity. Sometimes there are 2% mixture of the other seeds. As for the quality of sowing I Class (class) -

95% of the seeds germinate, the seeds purity 98%, and a mixture of other seeds 2%. Class I I is 80, 95 and 0.1%. In turnip seeds conditioned humidity should not exceed 9%.

The shelf life of 4-5 years of seed storage.

According to the T.E. Ostanakulov (1997); Balashyov N.N., Zeman O.G. (1981); Zuev, A. Abdullaev (1997); Buriev H.Ch. and others (2002), dry pods thresh threshing machines MO-700, MC-1100, then the seeds are selected machines Su-0, 1, OC-4, 5A and cleaning "Triumph". At the end of turnip seeds machine selects the "snake."

Yields is 3-4 quintals. Turnip seeds are stored in dry, ventilate premises in sacks.

Turnip root vegetable compartment for seeds, after ripening, cut the leaves of the fruit leaving a 1-2cm. Then the big beat off for sowing. On the southern strip put it in the winter, and in other places in late February early March. If the fruit plant spring, it is stored in trenches in stores under sand. Before storing the tubers treated with 50% TMDT (8 kg / t).

Root vegetable seeds for spring planting close to 70 cm between rows and 50-60cm, and cover the top with sand on 5-6cm, and autumn sowing cover on top of the 12-15cm sand. Root for semyanovodstvo watered 4-5 times, 3-4 times cultured and treated with 1-1.5 quintal of ammonium nitrate per 1 ha and fertilized with superphosphate. Yields of 3-4 ha / y. seeds.

#### **Chapter IV. Economic value of turnip cultivation technology.**

Specified return on crop production technology, and then offer it to production. The highest yield of the cultivar "Namangan mahalliysi" is considered to be cost-effective to manufacture. This is noted in the "B Map technology advances and obtain a product key crops of agriculture."

The seeds are planted 10 varieties of turnip-August. Consumption of 2.5 kg of seed per hectare, the price is equal to 30,000 sums just spend 75,000 amounts.

To prepare the seed of all varieties of turnip seeds for plowing, harrow spent 251,500 amounts, and for planting the seed of the sums expended 100,400.

On plant care - watering, fertilize, weeding, pest and use of expenses - 556,000 sums. (Table 7)

Harvesting and transportation of spent differently. It averaged 743,252 757,400 sums and amounts. The results of all expenses amounted to 1,326,152 amounts to 1,340,300 amounts. According to the approved routing it is 32%. In December 2012, the sale of 1kg of turnips cost 600 sums. According to the studied varieties of net income "Namangan mahalliysi" is (12,750,804 sum / ha) and low profits from "Samarkand mahalliysi" is equal to 11,749,479 sum / ha.

So farmers grow the variety offered "Namangan mahalliysi" because of the high profits.

**Table 7.** *Economic indicator for the cultivation of varieties of turnip.*

Past events	Grades		
	<i>Namangan mahalliyi</i>	<i>Samarkand mahalliyi</i>	<i>Muyassar</i>
Quantity of crops, kg	<b>2,5</b>	<b>2,5</b>	<b>2,5</b>
Cost, sum	<b>75 000</b>	<b>75 000</b>	<b>75 000</b>
Preparation of soil for seeding, sum	<b>251 500</b>	<b>251 500</b>	<b>251 500</b>
Seeding, sum	<b>100 400</b>	<b>100 400</b>	<b>100 400</b>
Treatment, sum	<b>556 000</b>	<b>556 000</b>	<b>556 000</b>
Harvesting, sum	<b>201 400</b>	<b>187 252</b>	<b>188 917</b>
Transportation, sum	<b>156 000</b>	<b>156 000</b>	<b>156 000</b>
All expenses, sum	<b>1 340 300</b>	<b>1 326 152</b>	<b>1 327 817</b>
Additional expenses (32 %), sum	<b>428 896</b>	<b>424 369</b>	<b>424 901</b>
The general expenses, sum	<b>1 769 196</b>	<b>1 750 521</b>	<b>1 752 718</b>
The crop , t / ha	<b>24,2</b>	<b>22,5</b>	<b>22,7</b>
Crop cost , sum	<b>14 520 000</b>	<b>13 500 000</b>	<b>13 620 000</b>
1 ton of the crop cost price , sum	<b>73 107</b>	<b>77 801</b>	<b>77 212</b>
Net profit , sum	<b>12 750 804</b>	<b>11 749 479</b>	<b>11 867 282</b>
Profitability ,%	<b>721</b>	<b>671</b>	<b>677</b>

## Conclusion

On the basis of researches spent and the analysis of turnip cultivation technology, have come to following conclusion:

1. On April, 1, 2012 there are 67412 farms, with the ground area of 5294, 2 thousand hectares all over the Republic.
2. Now under turnip cultivation are allocated 13 000 hectares of the land, which productivity is 199 c/ha, the received crop makes up 260 000 tons.
3. Turnip is considered a herb, which root is rich in carbohydrates, vitamins, enzymes, fragrant substances and mineral salts.
4. The French scientists have come to a following conclusion that turnip can give cheap fuel. From 1000 kg of turnip, it is possible to receive 100-120 l of combustible spirit. It means, that if to plant turnip plantations, the received fuel can be used for driving of motor vehicles and for manufacture of spirit electric bulbs.
5. In a palace of Zaxiriddin Muhammad Bobur, the healer Yusufiy Al-Hiraviy wrote a work «On advantage of good things», where has noted an advantage of turnip seeds at treatment of many illnesses.
6. Turnip is considered a cold-resistant and cold-loving culture, the seeds sprout at temperature + 3-6 °C. At temperature +18-20°C, the fruits ripen. In 3-6 day after crops, the seeds sprout. Duration of day helps flowering and fruit occurrence. And days shortness prevents the turnips development. The soil with humidity of 70-85 % is necessary for growth and maturity of fruits. Turnip likes the easy, sandy soil.
7. The potato, cabbage, tomatoes, cucumbers are considered good predecessors of turnip. For purpose achievement, turnip seed in summer after early ripening vegetables, and in the autumn after gathering of grain crops.
8. Before crops the soil harrow, loosen and make even. For reception of 15-20 tons of a crop, the soil is processed with 120-150 kg/ha of nitric, 80-100 kg/ha

of phosphoric, 40-50 kg/ha of potash fertilizer. For destruction of multiflight weeds, the soil is processed by 40-45 kg of herbicide on a hectare.

9. On environmental conditions of Uzbekistan, the northern areas seed turnip in the middle of July, the central regions sow in the middle of July prior to the beginning of the first decade of August, and southern region from August, 10 to August, 20. And a crop collect in October and November, before occurrence of colds in the Republic.
10. Now in the Republic the zoned grades of Mujassar, the Namangan local, Samarkand local are applied.
11. The turnips seeds sow without soaking. To the seeds add yeast. Turnip is planted by one-line method with intermediate distance in 60 sm, or a tape method 50+20/2x15 sm. Sow on depth from 1 to 3 sm on easy, sandy soil.
12. After full germination of seeds for 12-15 day it thin out, after 2-4 weeks thin out again. The soil should keep humidity of 70 % during formation period, and 80 % of humidity during cropping time.
13. For all period of growth, the turnip is watered 10-12 times. And soil, which has the superficial ground waters, is watered 6-8 times. The norm of watering makes up 500-600 m<sup>3</sup>.
14. For pests and illnesses controle, the turnip is processed by BI-58 (0,5-0,1 l/ha), carbophose (0,6-1,2 l/ha), benzophosphate (3-3,5 l/ha), deciss (0,3-0,5 l/ha).
15. Against «Mealy dew» process by sulfuric powder solution and by lime, and also by modern preparations of Tilt, Topaz and Vektra of 0,3-0,4 l/ha.
16. In the central regions the crop is collected for 2-3 weeks, and northern regions for 2-3 weeks forward. During gathering, selection and transportation of a crop, the root crops should not be damaged, as the damaged fruit is badly stored.
17. For reception of turnip seeds, the great attention is given to thinning and to application of fertilizers. The field allocated for cultivation of seeds, should

be on 600-2000 metres far from other fields. The root crop for seeds is planted the early spring (February-March) and the late autumn (November). Autumn crops give a bigger crop.

18. Root crops for seeds are planted under the scheme 60x60 sm, the distance between rows 35-40 sm on depth of 12-15 sm, in the spring on depth of 5-7 sm.
19. During the period of care, the turnip 1-2 times is thinned, and 5-7 times is watered. Ripe seeds are of dark brown colour. One hectare of the earth gives 300-400 kg of seeds.
20. The highest profit give the grade Namangan local (gives 12 750 804 sum/ha), and the lowest profit is at a grade Samarkand local (11 749 479 sum/ha).
21. To farms, it is recommended to grow up a turnip grade «Namangan local», as a highly-profitable grade.

### **Offers on manufacture**

1. Turnip is considered one of useful, medical vegetables; therefore, it is necessary to use it more often in food.
2. For turnip crops, it is necessary to choose easy, sandy soil and to sow on the places released after harvesting of a potato, cabbage, tomatoes and cucumbers.
3. For northern regions of Uzbekistan, we suggest to sow turnip in summer in the middle of July, for the central regions - in the end of July - the beginning of August, for the southern regions - from August, 10 till August, 20.
4. For prevention of turnip from illnesses of mealy dew, we suggest to use a powder of sulphur and preparations of type of Tilt, Topaz and Vektra.

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3. [Http://forum.ziyouz.com/index.php?topic=5987.65;wap2](http://forum.ziyouz.com/index.php?topic=5987.65;wap2)
4. [Http://tabiat-uz.narod.ru/shifobaxsh\\_nematlar.htm](http://tabiat-uz.narod.ru/shifobaxsh_nematlar.htm)
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6. [Http://www.bee.uz/](http://www.bee.uz/)
7. [Http://www.agriculture.uz/](http://www.agriculture.uz/)

8. [Http://www.semena.uz/](http://www.semena.uz/)
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10. [Http://www.book.uz/](http://www.book.uz/)
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