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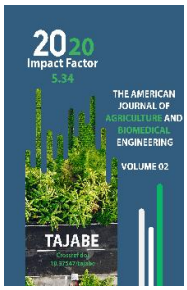




# Efficiency Of Resource-Saving Technology Of Tillage Of Andijan-36 Cotton Variety

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## ABSTRACT

Using resource-efficient agro-technology of tillage, using a new combined unit, 50% of the annual norm of 200 kg / ha of nitrogen was applied to the pods in autumn in the form of ammonium nitrate, and the remaining 50% was applied in the form of ammonium nitrate. The cotton yield was 37.9-40.4 c / ha in single-row and doublesown variants. There were an additional yield of 4.1-5.9 c / ha compared to the control variants the highest economic efficiency was achieved. The net income from this option was 2079.1-2793.7 thousand sums, the level of profitability was 52.3-68.4%, the net profit was 1127.7-1569.3 thousand sums compared to the control option, and the level of profitability is 29.1%. Was up 38.8 percent.

## KEYWORDS

Soil, Cotton, Single Row and Double Row, Cotton Yield, New Combined Technology, Andijan - 36 Varieties, Liquid Ammonia, and Net Income.

## INTRODUCTION

Nowadays in the world practice, the cultivation of crops with minimal tillage is applied on area of more than 100 mln. a hectare, the combined system of tillage is a comprehensive measure. This method is effective in soils with different yields, especially in fertilized areas (where the NPK balance is high). Minimal tillage compared to

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traditional technologies is not only energy efficient but also soil protection technology. Minimal tillage technologies, which are performed by using several operations simultaneously, are widely used in Canada, USA, Germany, Russia, India, Australia and other countries.

Using combined techniques in minimal tillage allow to maintain soil fertility, prevent soil compaction, reduce erosion processes, ensure food security through the use of science-based technologies of efficient use of mineral fertilizers at the expense of early, high and quality yields. Therefore, one of the main tasks today is to develop energy-saving technologies and technical means of soil protection, the application of minimal tillage in the care of cotton and its complex crops.

It is known that the yield and quality of fiber of each cotton variety depend primarily on the adherence to scientifically sound, high-level modern agro-techniques and the timely quality of appropriate agro-technical measures, taking into account their biological properties. In the research of A. Ochirov, G. Muchkaeva, N. Bavaev [1] at Kalmykia State University, using resource-efficient agrotechnology of tillage, in the cultivation of winter wheat, the cost of oil is 2-2.5 times higher than in the cultivated variant, and the cost is 30 -40% decreased. In addition, AK Kashkarov, T.Z. Fayziev [2] in tier experiments achieved to get an additional cotton crop 3.7 per hectare through keeping suitable density of soil for cotton, high temperature for seeds to germinate quickly. Moreover cotton grows and develops faster, the cotton crop ripens 4-5 days earlier than in a normal flat field. Based on the scientific research's results of S.N.Ryjov, V.P.Kondratyuk and Yu.A.Pogosov [3], the method of sowing the seeds in early spring to the buds obtained in the fall, the emergence of a flat seed and ultimately higher yields than cotton, together this method is fully scientifically and practically based on its economic efficiency.

In the light gray soils of Andijan region, S.Yusupov, A.Khaydarov, T.Kamilov [14] inform when Andijan-33 cotton variety seedlings's thickness is 111-165 thousand bushes in the scheme 90x10-1 and 90x10-1-2 and mineral fertilizers are used for per hectare at the rate of 250-175-125 kg, there will be the 37.8 c/ ha of cotton yield, which is 3.2 t / ha more than the control.

S.Bakhromov, U. Mukaramov [4], K.M.Tojiev [5], A.Khaydarov, Q.Qirgizbaev [6], Sh.T.Salomov [7], S.T.Negmatova [8], S.Ubaydullvea [9] conducted scientific research to develop various technologies for the efficient use of labor, water and energy resources and product cost-effective, affordable and high-quality products.

Khasanova FM, Khasanov MM, MS Atabaeva [10] in their scientific researches tillage the soil to a depth of 3035 cm in autumn with the help of a combinatorial aggregate, they obtained the porosity of soil increased to 1.7-2.2% in the variants nitrogen in the form of liquid ammonia at a rate of 100 kg / ha and in the variants of 100 kg / ha of nitrogen in the form of ammonium nitrate during the period of application of cotton compared to the pre-treatment condition in accordance with the seedling thickness. In addition, it was increased to 0.4-0.5% compared to 1and 2 control variants.

## RESEARCH METHODS

The research was conducted in 2015-2017 on the farm "Davr Hamroqligi" in Kurgantepa district of Andijan region. The experimental field was carried out in the conditions of old irrigated light gray, moderately sandy mechanical composition, groundwater at a depth of 4.0-5.0 meters. The alkalinity of the soil solution is pH 7-7.4; Humus and gross nitrogen content are 0.8-0.9 and 0.05-0.09%, respectively.

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The experimental options were located in 3 circle, one tier, each option was 8 rows, the total variant area was 720 m2, and the calculated area was 360 m2.

The was dispersion analyzing of accuracy of the yield-based an the of experimental options and reputations [11]. Methods were used to determine the agrochemical [12] and agro-visical properties of experimental field soils [13].

**The experiments were conducted on the basis of the experimental system given in 2015-2017.**

**Table 1:**

**Experimental System**

| Tillage method | Planting method | Theoretical seedling thickness |
|---|---|---|
| Plowing with a plow to a depth of 30-35 cm (Control) | 90x10-1 | 90-100 |
| | 90x(30x12)-1 | 140-150 |
| Trimming to a depth of 30-35 cm using a new combinatorial aggregate | 90x10-1 | 90-100 |
| | 90x(30x12)-1 | 140-150 |
| Trimming to a depth of 30-35 cm using a new combinatorial aggregate (in the fall) | 90x10-1 | 90-100 |
| | 90x(30x12)-1 | 140-150 |

Note: In options 1-2, the soil is plowed to 30-35 cm as usual way and piles are formed at a height of 30-35 cm, the annual norm of mineral fertilizers is NRK-200-140-100 kg / ha.

In 3-4 variants, the soil is treated with a new combination aggregate, 30-35 cm in height is obtained, the annual norm of mineral fertilizers under nitrogen is 30-35 cm in the form of liquid ammonia in the amount of 200 kg / ha and R-140-100 kg / ha.

In 5-6 variants, the soil is treated with a new combination, 30-35 cm in height, 30-35 cm of mineral fertilizers are applied under the annual norm of nitrogen in the amount of 100 kg / ha of liquid ammonia, the remaining 100 kg / ha in the remaining period of cotton ammonium nitrate in the form of, RK-140-100 kg / ha.

In 2015-2017 there ware made experiments about effect of nitrogen fertilizer in the form of ammonia on the cotton crop of Andijan-36 cotton variety with the new combined technology of tillage.

## RESEARCH RESULTS AND THEIR DISCUSSION

In our study, using traditional and resource-efficient agro-technologies of soil cultivation, sowing seeds in single-row and double-row methods, using nitrogen fertilizers in liquid ammonia and ammonium nitrate forms during maintenance, comparing the two methods,

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the agrophysical properties of soil and yield of cotton were studied.

In our experiment, by the end of the cotton growing period, the bulk mass of the soil was tillaged using a combination aggregate to a depth of 30-35 cm. As a result there was accelerating according to thickness of the seedlings to 0.17-0.027g/cm3 in variants nitrogen in the form of ammonia at a rate of 100 kg / ha and in the variants of 100 kg / ha of nitrogen in the form of ammonium granules during the period of application of cotton comparing to 1-2 control variants (driving liner was 0-30cm). And up to 0.021-0.037g / cm3 in the sub-driving (30-50 cm) layer, the combination aggregate 0.001-0.006 in accordance with the layers in variants 3-4 given in the form of ammonia at a rate of 200kg / ha with the simultaneous extraction of pulp by iodine treatment; An improvement of 0.001–0.016 g / cm3 was observed.

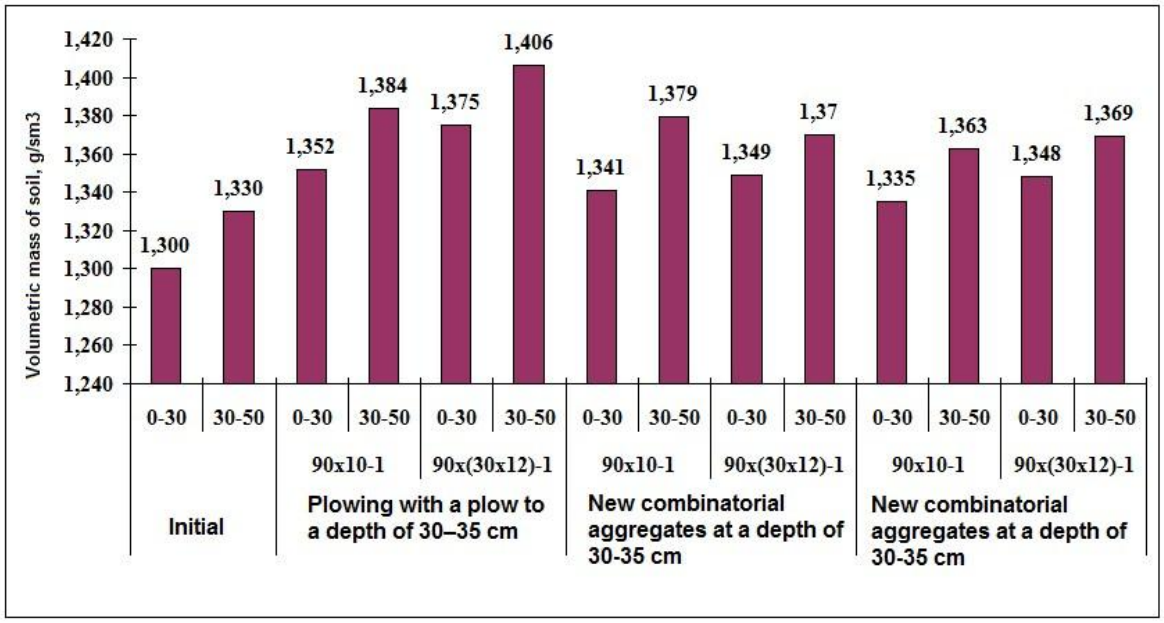


**Figure 1: The Effect of Different Tillage Methods on the Volume of the Soil**

In our study, the water permeability of 5-6 control variants was 656.2 m3 / ha at the end of the application period where were use the annual rate of nitrogen fertilizers was 50% in the form of liquid ammonia and the remaining 50% in the form of ammonium nitrate. It was 199.1 m3 / ha more than 1-2 variants control which tilligated with the traditional method and21,3 м3/ha more than 3-4 control variants where was used liquid ammonia (NH4) 200kg/per ha.

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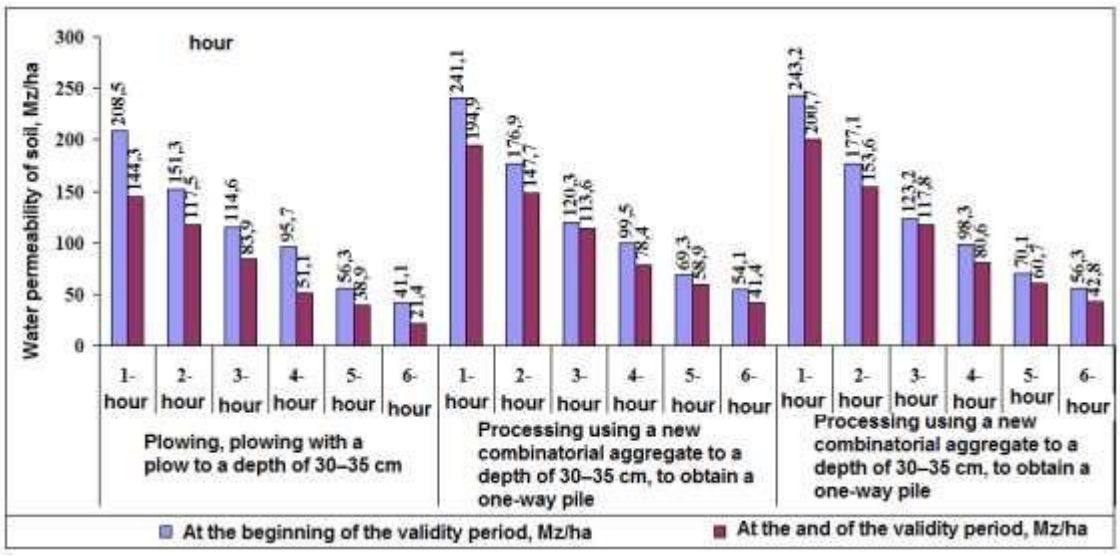


**Figure 2: The Effect of different Tillage of the Soil on Its Water Permeability, $m^3$/ha(2015)**

In our study, the suitable soil conditions, which are created by using new combined technology, led 25-30% acceleration of the seeds of Andijan-36 cotton variety and 3-5 days earlier germination, comparing to usual variants where soil plowed 30-35 cm. As a result, the growth and development of cotton in these variants has accelerated, creating the opportunity to grow a fabulous and quality cotton crop.

Using a combination of aggregates, the seeds were sown in a 90x10-1 system In Option 5, the average number of seedlings was 98.5 thousand in three years (50% of 200kg/ha nitrogen fertilizers was in the form of liquid ammonia and other 50% was in the form of ammonia granules) and in option 6, where the planting system was 90x (30x12) -1, the number of seedlings was 148.8 thousand.

In our study, the use of resource-efficient agro technologies had a positive effect on the growth and development of cotton, so in autumn, the soil was treated with a combination of aggregates, 100 kg of nitrogen in the form of liquid ammonia and 100 kg of ammonium nitrate. When the planting scheme was 90x10-1 the number of blocks in the variant were 7.1; 10.9 by terms grains, at the rate of the same method and mineral fertilizers, only the planting system was maintained 90x (30x12) -1 the number of blocks in the variant were 5.0; 8.9. They were 0.8-2.7; 0.4-1.7 more than control variants. Also, application of resource-efficient agro-technology to the soil in the care of Andijan36 cotton variety,( by using a new combined unit) using 200 kg / ha annual norm of nitrogen in 100% and 50% in the form of liquid ammonia was applied to the pods and the cotton yield in variants 3-4 and 5-6, planted in single rows and in pairs, was 36.2 and 39.2 on average in three years; 37.9 and 40.4 c / ha, respectively, with an additional cotton yield of 4.1–5.6 c / ha compared to the traditionally maintained variants.

In the autumn, using a combination of aggregates, In 4-6 variants where used the annual rate of nitrogen under the bushes was 200 kg / ha ( 100 and 50%) in the form of liquid ammonia seeds planted in the cocoons, the additional cotton yield was 3.2 and 3.4 c / ha. however, no significant differences were observed in both norms of ammonia.

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Thus, using a new combined tillage unit, it was found that in the fall, 50% of the annual rate of 200 kg / ha of nitrogen under liquid ammonia and the remaining 50% of nitrogen in the form of ammonium nitrate during the growing season gave better results.

Resource-saving agro-technology of tillage was applied, ie using a new combined unit, one-time plowing was carried out and 200 kg / ha of nitrogen was fed in the form of liquid ammonia and the remaining 50% of nitrogen in the form of ammonium nitrate during growth. In 5-6 variants, the yield of cotton of Andijan-36 cotton variety was 37.9-40.4 c / ha, and nitrogen in the form of liquid ammonia was proved to be 1.7-2.2 c / ha higher than in the variants fed at the rate of 200 kg. .

It is important to determine the useful or highly effective results of each agro-measure tested in experiments and to evaluate them economically in terms of their implementation in production.

Gross profit and net profit were determined based on the average 3-year costs associated with the experimental options. Accordingly, the profitability level of the options was calculated.

**Table 2: Influence of Agro-measures on Cotton Yield of Andijan-36 Cotton Variety, c / ha (2015-2017) Average 3 Years**

| № | Soil cultivation method | Planting system | 2015 year | 2016 year | 2017 year | Average 3 years | Additional yield to compared control c/ha |
|---|---|---|---|---|---|---|---|
| 1 | Plowing with a plow to a depth of 30-35 cm (Control) **NPK 200; 140:100** | **90x10-1** | 34,1 | 33,2 | 34,1 | 33,8 | |
| 2 | | **90x(30x12)1** | 34,9 | 33,9 | 34,6 | 34,8 | |
| 3 | Processing with the help of a new combinatorial aggregate at a depth of 30-35 cm, in the fall (autumn) liquid ammonia **200+ PK 140:100** | **90x10-1** | 37,0 | 35,9 | 35,7 | 36,2 | 2,4 |
| 4 | | **90x(30x12)1** | 38,8 | 37,3 | 38,5 | 39,2 | 4,4 |
| 5 | Processing with the help | **90x10-1** | 39, | 37,0 | 37,3 | 37,9 | 4,1 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | of a new combinatorial | | 4 | | | | |
| 6 | aggregate at a depth of 30-35 cm, in the fall (autumn) liquid ammonia **100+ NPK 100; 140:100** | **90x(30x12)1** | 40,7 | 39,2 | 41,3 | 40,4 | 5,6 |
| 2015 year - Sd=0,19 c/ha; $HCP_{05}$=0,4 c/ha; $HCP_{05}$=1,07%; Sd=0,14 c/ha; $HCP_{05}$(A)=0,29 c/ha; $HCP_{05}$=0,77%; Sd=0,11 c/ha; $HCP_{05}$(B)=0,23 c/ha; $HCP_{05}$=0,61% | | | | | | | |
| 2016 year - Sd=0,38 c/ha; $HCP_{05}$=0,8 c/ha; $HCP_{05}$=2,22%; Sd=0,27 c/ha; $HCP_{05}$(A)=0,57 c/ha; $HCP_{05}$=1,58%; Sd=0,22 c/ha; $HCP_{05}$(B)=0,46 c/ha; $HCP_{05}$=1,29% | | | | | | | |
| 2017 year - Sd=0,39 c/ha; $HCP_{05}$=0,82 c/ha; $HCP_{05}$=2,23%; Sd=0,28 c/ha; $HCP_{05}$(A)=0,59 c/ha; $HCP_{05}$=1,6%; Sd=0,23 c/ha; $HCP_{05}$(B)=0,48 c/ha; $HCP_{05}$=1,32% | | | | | | | |

In addition, the purchase prices of raw cotton for 2015-2017 were calculated based on an average of 3 years.

According to the results of the three-year study, under the influence of different agronomic measures used in the experiments, each option had a certain level of economic performance, while each option had its own costs and cotton yield.

The agro-technical measures were carried out in the traditional way, such as plowing in the fall, followed by plowing, and in early spring the yield was 33.8-34.5 c / ha in the area where the seeds were sown in single row and double sowing. The income were 5094.9-5373.2 thousand sums, total expenses amounted to 4143.4-4148.8 thousand sums, net profit amounted to 951.4-1224.5 thousand sums, and the level of profitability was 23.2-29.6%. .

With the help of a new combined tillage unit, Andijan-36 cotton seeds were sown in the form of 100 kg of liquid ammonia with an annual rate of 200 kg / ha of nitrogen under the bushes in autumn. Yield was 36.2-38.2 c / ha, total cotton yield was 36.2-38.2 c / ha. Proceeds from the sale of raw materials amounted to 5746.1-6210.8 thousand sums, total expenses - 3947.6-4065.1 thousand sums, net profit - 1798.5-2145.7 thousand sums, and the level of profitability - 46.2-52.2% did. This was 23.0-22.6 percent higher than the control option 1-2 using the traditional method of tillage.

Also, from the resource-efficient agro technology of tillage, using a new combination unit, ammonium nitrate was applied in autumn in the form of 50 kg of liquid ammonia at the rate of 200 kg / ha of nitrogen, and the remaining 50% was stratified during the operation of Andijan-36 cotton

variety. In the variant (5-6 var.), the yield of cotton is 37.9-40.4 c / ha, the soil is plowed to a depth of 30-35 cm in the traditional way, and then the control of the seedlings is obtained compared to the options (1-2 var.) an additional yield of 4.1-5.9 c / ha was obtained, with the highest economic return. The net income from this option is 2079.1-2793.7 thousand sums, the yield is 52.3-68.4%, the soil is plowed in the traditional way at a depth of 30-35 cm, and the net profit is 1127.7-1569. Up to three, thousand sums, and the level of profitability was high at 29.1-38.8 percent.

## Conclusion

In summary, the soil was treated using a new combinatorial unit by adding 200 kg of liquid ammonia 50% of 200kg liquid ammonia first time and using other 50% of it during the growing season could lead to grow high quality cotton earlier. According to the results of the study, the use of resource-efficient agro technology of tillage in the care of Andijan-36 cotton variety, i.e. by using a combination unit, simultaneously apply 50% of the annual norm of nitrogen in the form of liquid ammonia and other 50% were stratified during the growing season is economically efficiency.

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