

## YIELD OF DIFFERENT VARIETIES TOBACCO LEAF DEPENDING ON FERTILIZERS AND NUMBER OF DEMOLITIONS

*The article shows the dependence of the yield of tobacco leaf of Ternopil 14, Berley 38 and Virginia 27 varieties on the fertilization and the number of demolitions. Research has found that the maximum yield was observed with the introduction of the full version of mineral nutrition ( $N_{120}P_{90}K_{90}$ ) for the five-leaf harvesting in Ternopil 14 and Berley 38 varieties, and Virginia 27 variety received the largest crop in the full version of mineral fertilization in the maximum norm ( $N_{120}P_{120}K_{120}$ ).*

**Keywords :** tobacco, leaf yield, fertilization, variety, number of demolitions

**Introduction.** In Ukraine today one of the main areas of crop is scientifically grounded application of obtaining high yields of crops, including tobacco as an important technical culture.

An optical-biological structure of planting crops should be established for the formation of high yields with high levels of quality that will enable to use efficiently photosynthetically active radiation. This can be achieved by choosing the optimal level of mineral nutrition with the establishment of rational choice of number of demolitions on seeding crops including botanical and biological characteristics of the plants. These issues are not disclosed enough in terms of southern forest-steppe of Western, so there is a need for a detailed study of some questions of cultivation of tobacco.

*Review of existing publications on this issue.* A.G. Aliev [1] points out that the application of a complete fertilizer significantly improves the quality of tobacco. The role of individual batteries in the formation of yield and changes in the quality of the products in different soil and climatic conditions vary. In terms of Lahodeha (Georgia) on superficial nature of soils the most yield (13,5 t/ha) was obtained by the joint use of 80 kg nitrogen, 120 kg phosphorus and 120 kg potassium per hectare. In terms of Armenia tobacco plants are fertilized in 3 times - the first and second top dressing was contributed by 1,5 q of nitrogen and 0,8 q of phosphorus per hectare, and the third - only phosphorus at a dose of 1 q / ha.

To increase the yield of tobacco D.V. Balanda and Yu.A. Shtompel [2] propose to increase the standards of fertilizers - nitrogen 80, phosphorus 90, potassium 100 kg / ha. In the experiments of V.A. Stetsevych [3] the highest yield of tobacco ( 22,6 t/ha) was obtained by simultaneous application of manure and a complete fertilizer. Yield of tobacco increases especially in manure application in the compound with chemical fertilizers. Such use of fertilizers is best suited to the biological and physiological requirements of tobacco [4].

Along with nitrogen, phosphorus and potassium plant of tobacco needs magnesium, boron, molybdenum and other trace elements for normal growth and development during the growing season [5].

*The purpose of research* - to determine the optimal conditions for agri-environmental tobacco growing in the southern part of western forest-steppe, which will provide a maximum yield of raw materials.

**Materials and methods.** Researches were conducted at the experimental field of Podilski State Agricultural and Technical University during 2005-2007 years. Soil of tested areas is ashed black soil, which is characterized by following agrochemical parameters: humus - 3,7-4%, pH salt - 6,5-6,9, nitrogen - 102-120 mg / kg  $P_2O_5$  - 107-123 mg / kg and  $K_2O$  - 126-143 mg / kg.

Research of agrotechnology items of growing tobacco were carried by laying two field experiment: factor A - system of culture fertilization; factor B - scheme of harvesting (demolition) of tobacco leaves. Varieties: Ternopil 14, Virginia 27 and Burley 38. Separate experiment was laid

for each variant of tobacco. Total area was 37,5 m<sup>2</sup>, accounting area was 25 m<sup>2</sup>, repetition of the experiment was four times. Researches were carried out according to conventional methods [6].

**Results.** The highest yield of tobacco leaves was dependent on the number of demolitions. For different varieties at three demolitions it was harvested 1,83-2,3 t/ha, at five demolitions - 2,17-3,14 t/ha. That is, the more demolitions - the higher yield of leaves. At the same time, different doses and value of fertilizers influence in different ways on the yield of raw tobacco. Separately for years, and the average values show increased yields of tobacco depending on the doses and ratios of nitrogen, phosphate and potash. This is due to a better supply of plant with nutrients during the period of growth and cultural development.

It should be noted that it was obtained yield of tobacco leaves in Ternopil 14 variety, which varied by variations within 1,71-2,50 t/ha. At five demolitions and within 1,42-2,10 at three demolitions. Maximum increase of leaves yield 0,79 t/ha or 46 % was obtained by introducing a complete fertilizer at a dose of 120 kg on 1 ha of nitrogen and 90 kg for phosphorus and potassium. Increase of phosphorus and potassium nutrition (N<sub>120</sub>P<sub>120</sub>K<sub>120</sub>) does not improve yield of tobacco leaves. Intensified supply of phosphorus (P<sub>120</sub>) on the background N<sub>90</sub>K<sub>90</sub> increases the yield of leaves by 39% (Table 1).

Table 1

**The yield of tobacco leaves of Ternopil 14 variety depending on the amount of fertilizer and number of demolitions (average for 2005-2007), t/ha**

Fertilization (factor A)	Number of demolitions (factor B)			Average of factor A	LSD <sub>05 A</sub>
	0	3	5		
N <sub>0</sub> P <sub>0</sub> K <sub>0</sub> (control)	0	1,28	1,71	1,00	0,10
N <sub>60</sub> P <sub>90</sub> K <sub>90</sub>	0	1,62	2,09	1,24	
N <sub>90</sub> P <sub>90</sub>	0	1,57	2,07	1,21	
N <sub>90</sub> K <sub>90</sub>	0	1,49	1,92	1,14	
P <sub>90</sub> K <sub>90</sub>	0	1,57	2,07	1,21	
N <sub>90</sub> P <sub>90</sub> K <sub>90</sub>	0	1,69	2,22	1,30	
N <sub>120</sub> P <sub>90</sub> K <sub>90</sub>	0	1,87	2,50	1,46	
N <sub>90</sub> P <sub>120</sub> K <sub>90</sub>	0	1,80	2,38	1,39	
N <sub>90</sub> P <sub>90</sub> K <sub>120</sub>	0	1,68	2,26	1,31	
N <sub>120</sub> P <sub>120</sub> K <sub>120</sub>	0	1,91	2,45	1,45	
Average of factor B	0	1,65	2,17	$\bar{X} = 1,27$	
LSD <sub>05 B</sub>	0,06			LSD <sub>05 AB</sub> = 0,16; $S_{\bar{X}} = 2,5$	

The use of all three types of nutrition in the ratio N<sub>90</sub>P<sub>90</sub>K<sub>90</sub> provides harvest of tobacco leaves at the level of 2,22 t/ha, 0,51 t/ha higher than the control. Double combinations of mineral nutrients for better yield was common variant of nitrogen and phosphorus (N<sub>90</sub>P<sub>90</sub>) and phosphorus and potassium (P<sub>90</sub>K<sub>90</sub>), which provides a 0,36 t/ha of additional products. Nitrogen- potassium fertilizer allowed to obtain increase of harvest tobacco leaves by 0,21 t/ha.

In the variants with three demolitions it was received the same dependence on the yield of tobacco leaves according to the use of chemical fertilizers, only 31% less.

In the variety Berley 38 technical productivity of culture in all variants of the experiment was higher than in Ternopil 14 and Virginia 27 and averaged 1,81 t/ha (Table 2).

Table 2

**The yield of tobacco leaves of Berley 38 variety depending on the amount of fertilizer and number of demolitions (average for 2005-2007), t/ha**

Fertilization (factor A)	Number of demolitions (factor B)			Average of factor A	LSD <sub>05</sub> A
	0	3	5		
N <sub>0</sub> P <sub>0</sub> K <sub>0</sub> (control)	0	1,72	2,32	1,35	0,12
N <sub>60</sub> P <sub>90</sub> K <sub>90</sub>	0	2,23	3,04	1,76	
N <sub>90</sub> P <sub>90</sub>	0	2,24	3,13	1,79	
N <sub>90</sub> K <sub>90</sub>	0	2,21	2,98	1,73	
P <sub>90</sub> K <sub>90</sub>	0	2,21	3,06	1,76	
N <sub>90</sub> P <sub>90</sub> K <sub>90</sub>	0	2,29	3,11	1,80	
N <sub>120</sub> P <sub>90</sub> K <sub>90</sub>	0	2,85	3,84	2,23	
N <sub>90</sub> P <sub>120</sub> K <sub>90</sub>	0	2,37	3,23	1,87	
N <sub>90</sub> P <sub>90</sub> K <sub>120</sub>	0	2,29	3,11	1,80	
N <sub>120</sub> P <sub>120</sub> K <sub>120</sub>	0	2,56	3,57	2,04	
Average of factor B	0	2,30	3,14	$\bar{X} = 1,81$	
LSD <sub>05</sub> B	0,07			LSD <sub>05</sub> AB = 0,18; $S_{\bar{X}} = 2,7$	

Variants N<sub>120</sub>P<sub>90</sub>K<sub>90</sub> and N<sub>120</sub>P<sub>120</sub>K<sub>120</sub> differed by high productivity, where increase of yield was obtained in accordance with 1,53 and 1,25 t/ha or 66 and 54%. At three demolitions the yield of tobacco leaves reduces in these variants of fertilization to 2,85 and 2,56 t/ha. On average, this reduction in variants of fertilization was 36%.

In variant Virginia 27, the average yield of tobacco leaves in experiment was 2,67 t/ha. Dependence of the influence of fertilization and number of demolitions was similar to Ternopil 14 and Burley 38 varieties (Table 3).

Table 3

**The yield of tobacco leaves of Virginia 27 variety depending on the amount of fertilizer and number of demolitions (average for 2005-2007), t/ha**

Fertilization (factor A)	Number of demolitions (factor B)			Average of factor A	LSD <sub>05</sub> A
	0	3	5		
N <sub>0</sub> P <sub>0</sub> K <sub>0</sub> (control)	0	1,53	2,15	1,23	0,11
N <sub>60</sub> P <sub>90</sub> K <sub>90</sub>	0	1,84	2,54	1,46	
N <sub>90</sub> P <sub>90</sub>	0	1,80	2,47	1,42	
N <sub>90</sub> K <sub>90</sub>	0	1,66	2,35	1,34	
P <sub>90</sub> K <sub>90</sub>	0	1,77	2,45	1,41	
N <sub>90</sub> P <sub>90</sub> K <sub>90</sub>	0	1,85	2,60	1,49	
N <sub>120</sub> P <sub>90</sub> K <sub>90</sub>	0	2,25	3,10	1,78	
N <sub>90</sub> P <sub>120</sub> K <sub>90</sub>	0	2,27	3,11	1,79	
N <sub>90</sub> P <sub>90</sub> K <sub>120</sub>	0	1,98	2,73	1,57	
N <sub>120</sub> P <sub>120</sub> K <sub>120</sub>	0	2,31	3,20	1,84	
Average of factor B	0	1,92	2,67	$\bar{X} = 1,53$	
LSD <sub>05</sub> B	0,07			LSD <sub>05</sub> AB = 0,18; $S_{\bar{X}} = 2,5$	

**Conclusions:** The strong positive effect of fertilizer on all varieties was obtained by making N<sub>120</sub>P<sub>90</sub>K<sub>90</sub>. On average increase was 52%. Variant with doses of nitrogen, phosphorus and potassium 120 kg/ha of active ingredient was slightly lower, which provided an average yield increase of 49%. With decreasing of the number of demolitions, there is a decrease of the yield of raw tobacco on average by 31-38%.

Large increase of double combinations of fertilizers is provided by nitrogen- phosphorus fertilizer. The greatest yield was observed in the variant with the introduction of mineral nutrition ( $N_{120}P_{90}K_{90}$ ) by five times harvesting of leaves in Ternopil 14 and Burley 38 varieties, the largest yield was received in the full variant of mineral fertilization in the maximum norm ( $N_{120}P_{120}K_{120}$ ) in Virginia 27.

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### Анотація

**Сікора Ю.В.**

**Урожайність листків різних сортів тютюну залежно від удобрення та кількості ломок**

У статті показано залежність урожайності листків тютюну сортів: Тернопільський 14, Берлей 38 та Вірджинія 27 від удобрення і кількості проведених ломок. Дослідженнями встановлено, що максимальною врожайністю відзначався варіант із внесенням повного мінерального живлення ( $N_{120}P_{90}K_{90}$ ) за п'ятиразового збирання листків у сортів Тернопільський 14 і Берлей 38, а у сорту Вірджинія 27 найбільший урожай отримано на варіанті повного мінерального удобрення у максимальній нормі ( $N_{120}P_{120}K_{120}$ ).

**Ключові слова:** тютюн, урожайність листків, удобрення, сорти, кількість ломок

### Аннотация

**Сикора Ю.В.**

**Урожайность листьев различных сортов табака в зависимости от удобрений и количества ломок**

В статье показана зависимость урожайности листьев табака сортов Тернопольский 14, Берлей 38 и Вирджиния 27 от удобрения и количества проведенных ломок. Исследованиями установлено, что максимальной урожайностью выделялся вариант с внесением полного минерального удобрения ( $N_{120}P_{90}K_{90}$ ) при пятикратном сборе листьев у сортов Тернопольский 14 и Берлей 38, а у сорта Вирджиния 27 наибольший урожай получено на варианте полного минерального удобрения при максимальной норме ( $N_{120}P_{120}K_{120}$ ).

**Ключевые слова:** табак, урожайность листьев, удобрения, сорта, количество ломок