**INTENZIFICATION OF TOBACCO PRODUCTION IN THE REPUBLIC OF MACEDONIA**

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**ABSTRACT**

Intensification of agricultural production can be defined as an increase in agricultural production per unit of measurement (labor, means of production etc). Intensification at the level of a whole agricultural holding or its production unit represents a degree of change in the structure of production and the means engaged in the production.

The degree of agricultural intensification depends on environmental, technical-technological and economic conditions. The variability of these conditions requires appropriate adjustment of the degree of intensification. Intensification of an agricultural holding should be economically efficient, within the limits of the economic optimum for increase of assets and labor.

The final forms of intensification are extensive and intensive agricultural production, and between them there are different degrees of intensity. The increase in yields leads to a reduction of the fixed costs, which partially mitigates the increase of variable costs. When deciding on the economically optimal level of intensity, it is important to consider the total investments (sum of the fixed and variable costs per unit of measurement). In general, intensification can be expressed as obtaining a product at a lower cost, which is an indicator of the economic efficiency of production.

**Keywords:**intensification,tobacco production,economic efficiency,agricultural areas,tobacco producers(co-operators)

**ИНТЕНЗИФИКАЦИЈА НА ТУТУНОПРОИЗВОДСТВОТО ВО РЕПУБЛИКА МАКЕДОНИЈА**

Под интензивност на земјоделското производство се подразбира одредено вложување на средства и труд на единица капацитет на одредени средства на трудот.Интензификација на ниво на одделни земјоделски производи претставува степенот на вложувања на труд и средства на единица капацитет на средствата на трудот. Интензификација на ниво на цело земјоделско стопанство или негова производна единица претставува степен на промени во структурата на производството и ангажираните средства за производство.

Степенот на интензификацијана земјоделството претставува функција на природните, техничко-технолошките и економските услови. Променливиот карактер на овие услови условува соодветно прилагодување на степенот на интензивноста.Степенот на интензивност на едно земјоделско стопанство треба да биде економски ефикасен, односно да е во граници на економскиот оптимум за вложување на средства и труд.

Крајните облици на интензификација се екстензивно и интензивно земјоделско производство, а помеѓу нив се наоѓаат различни степени на интензивност. Зголемувањето на приносите доведува до намалување на фиксните трошоци на единица капацитет, со што делумно се ублажува зголемувањето на варијалбилните трошоци.При одлучувањето за економски оптималното ниво на интензивност треба да се земат во предвид вкупните вложувања (збир од фиксните и варијабилните трошоци на единица капацитет).Во основа,интензификацијата треба да се изрази како добивање на производ со пониска цена на чинење која е показател на економската ефикасност на производството.

**Клучнизборови:**интензификација,тутунопроизводство,економска ефикасност,земјоделски области,тутунопроизводители(кооперанти)

**INTRODUCTION**

In the production of raw tobacco, three phases and sixteen operations have been identified so far:

- seed production,

- field production of raw tobacco (11 operations)

- domestic manipulation of tobacco (5 operations).

The above mentioned phases and operations were determined through special research and analysis back in 1982, when they were performed exclusively by hand, which made the production difficult and labor-intensive. The research revealed labor-intensive tendencies in almost all phases and operations of tobacco production. The current intensification of the production is due to the use of improved and more available agrotechnics and cultural practices, especially in the phases and operations that can accept thе changes. The constant engagement of technical and agrotechnical measures not only increases the production of tobacco per unit area and per household but simultaneously humanizes the labor. Humanization of labor is even more important when there is a continuous reduction of household members and the use of technique and agrotechnical measures can compensate for this deficiency.

**TOBACCO-PRODUCING AGRICULTURAL AREAS**

Survey of tobacco-producing areas for a four decades period (1976-2015) are presented in the following table:

Table 1. Areas under tobacco in R. Macedonia (in hectares)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1976 | 30.000 | 1986 | 25.000 | 1996 | 30.000 | 2006 | 15.000 |
| 1977 | 28.000 | 1987 | 24.000 | 1997 | 17.000 | 2007 | 17.000 |
| 1978 | 27.000 | 1988 | 24.000 | 1998 | 22.000 | 2008 | 17.000 |
| 1979 | 28.000 | 1989 | 20.000 | 1999 | 20.000 | 2009 | 16.000 |
| 1980 | 27.000 | 1990 | 14.000 | 2000 | 25.000 | 2010 | 19.000 |
| 1981 | 25.000 | 1991 | 20.000 | 2001 | 20.000 | 2011 | 16.000 |
| 1982 | 27.000 | 1992 | 33.000 | 2002 | 21.000 | 2012 | 15.000 |
| 1983 | 27.000 | 1993 | 32.000 | 2003 | 15.000 | 2013 | 20.000 |
| 1984 | 26.000 | 1994 | 34.000 | 2004 | 15.000 | 2104 | 14.000 |
| 1985 | 26.000 | 1995 | 32.000 | 2005 | 16.000 | 2015 | 14.000 |
|  | 27.100 |  | 25.800 |  | 20.100 |  | 16.300 |

Source: Statistical Yearbook of SFR Yugoslavia, Association of Producers of R. Macedonia and Ministry of Agriculture, Forestry and Water Economy of R. Macedonia

Soil is a natural resource and most important factor in production of raw tobacco. It cannot be physically exhausted and has an unlimited period of use. The use of professional and scientifically based methods can improve soil quality. The soil quality, however, is not reflected in the increase of tobacco production Unlike other crops, tobacco growing areas do not increase but in the latest period they have even decreased. Presently, world’s total arable land is 1,405,000,000ha and only 0.25% of that area belongs to tobacco. Besides this, tobacco is grown on poorly productive soils with low land capability and on small fragmented areas which provide the producer significant economic effects compared to the production of other crops. These soils are not suitable for other crops except for tobacco. The magnitude of lands of this quality for cultivation of tobacco in the world is not known, but it is important that they exist and allow maximum production if the demand for them is increased. For illustration, the area planted with wheat is 700 times larger and the area under cotton is 10 times larger than that under tobacco, etc. Despite the small coverage of the agricultural land, the value of tobacco yield is much higher and multiplied. Data on areas planted with tobacco in R. Macedonia by decades are as follows: 1976-1985 - 27.100 ha, 1986-1995 - 25.800 ha, 1996-2005 - 20.100 ha and 2006-2015 - 16.300 ha. In relation to 360.000 ha of arable land in the country, the share of agricultural land under tobacco is: 1976-1985 - 7.5%, 1986-1995 - 6.6%, 1996-25005 - 5.4%, 2006-2015 - 4.2%. The participation of areas under tobacco is constantly decreasing in relation to the arable land, but the production of raw tobacco remains relatively stable. Data on the reduction of areas planted with tobacco by decades are presented through the following indices:

|  |  |  |
| --- | --- | --- |
| Decade | Area | Index |
| 1976-1985 | 27.100 | 100 |
| 1986-1995 | 25.800 | 95 |
| 1996-2005 | 20.100 | 74 |
| 2006-2015 | 16.300 | 60 |

The above indices show the dynamics of planted areas and their decrease of almost 40% between the first and the last decade analyzed.

**TOBACCO PRODUCTION IN THE REPUBLIC OF MACEDONIA IN THE PERIOD 1976-2016**

Tobacco is grown in almost the whole territory of the Republic of Macedonia, except in the western region. In other regions it is present with bigger or smaller deviations. The largest concentration of tobacco production is in the south-western region (municipalities Prilep, Bitola, Krusevo, Makedonski Brod, Demir Hisar, Dolneni, etc.) and central-eastern part (Veles, Negotino, Sveti Nikole, Vinica, Kocani etc.). In other producing regions, tobacco is less represented crop, especially in the south-eastern, north-eastern and the western region. In the areas planted with tobacco (Table 2), the following yields were obtained:

Table 2. Tobacco yield by years

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1976 | 34.000 | 1986 | 35.000 | 1996 | 15.000 | 2006 | 23.000 |
| 1977 | 32.000 | 1987 | 29.000 | 1997 | 25.000 | 2007 | 20.000 |
| 1978 | 30.000 | 1988 | 22.000 | 1998 | 20.100 | 2008 | 16.000 |
| 1979 | 29.000 | 1989 | 27.000 | 1999 | 32.000 | 2009 | 23.000 |
| 1980 | 23.000 | 1990 | 16.000 | 2000 | 28.000 | 2010 | 26.000 |
| 1981 | 31.000 | 1991 | 25.000 | 2001 | 20.000 | 2011 | 21.000 |
| 1982 | 36.000 | 1992 | 27.000 | 2002 | 23.000 | 2012 | 30.000 |
| 1983 | 22.000 | 1993 | 24.000 | 2003 | 23.000 | 2013 | 31.000 |
| 1984 | 31.000 | 1994 | 19.000 | 2004 | 20.000 | 2104 | 25.000 |
| 1985 | 30.000 | 1995 | 16.000 | 2005 | 23.000 | 2015 | 19.000 |
|  | 29.800 |  | 24.000 |  | 22.910 |  | 23.400 |

Source: Statistical Yearbook of SFR Yugoslavia, Association of Producers of R. Macedonia and Ministry of Agriculture, Forestry and Water Economy of R. Macedonia

The average production of tobacco ranged 29,800 t in the decade 1976-1985, 24,000 t in 1986-1995, 22,910 t in 1996-2005 and 23,400 t in 2006-2015. The growth of raw tobacco production in the above period can be represented through the following indices:

|  |  |  |
| --- | --- | --- |
|  Decade | Average tobacco yield (tons) |  Index |
|  1976-1985 |  29.800 |  100 |
|  1986-1995 |  24.000 |  80 |
|  1996-2005 |  22.910 |  77 |
|  2006-2015 |  23.400 |  78 |

The above data on areas planted with tobacco and the resulting tobacco yields expressed through the indices are in correlation with the fact that tobacco production has 22% lower index of reduction compared to the planted areas. It confirms that the productional capacity of the planted areas is significantly increased. Unlike the above statement, the production of tobacco has a tendency of pronounced stability with an average yield of 25.0270 t, which is close to the production of raw tobacco in the pre-transitional period. Comparison between these two parameters confirms the existing intensification in tobacco production.

**ENGAGEMENT OF TOBACCO GROWERS IN THE PRODUCTION OF TOBACCO**

The main resource in tobacco production is the engaged labor force, which is represented by the number of engaged co-operators in the following table:

Table 3. Co-operators engaged in tobacco production of R. Macedonia by years

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
| 1976 | 79.400 | 1986 | 80.250 | 1996 | 27.500 | 2006 | 29.200 |
| 1977 | 74.300 | 1987 | 57.800 | 1997 | 33.000 | 2007 | 29.700 |
| 1978 | 67.536 | 1988 | 54.400 | 1998 | 54.700 | 2008 | 31.000 |
| 1979 | 59.700 | 1989 | 49.100 | 1999 | 43.600 | 2009 | 39.000 |
| 1980 | 55.300 | 1990 | 38.800 | 2000 | 34.250 | 2010 | 41.000 |
| 1981 | 50.300 | 1991 | 40.700 | 2001 | 33.900 | 2011 | 33.200 |
| 1982 | 60.300 | 1992 | 49.350 | 2002 | 27.000 | 2012 | 15.000 |
| 1983 | 58.760 | 1993 | 53.800 | 2003 | 27.300 | 2013 | 29.100 |
| 1984 | 53.670 | 1994 | 35.400 | 2004 | 38.500 | 2104 | 42.400 |
| 1985 | 71.000 | 1995 | 24.250 | 2005 | 29.200 | 2015 | 28.450 |
|  | 63.026 |  | 48385 |  | 34.895 |  | 31.805 |

Source: Statistical Yearbook of SFR Yugoslavia, Association of Producers of R. Macedonia and Ministry of Agriculture, Forestry and Water Economy of R. Macedonia

Data on the number of tobacco producers (co-operators) for the analyzed period (1976-2015) show a 50% reduction in the engagement of labor force in the production of raw tobacco, which also confirms the intensification of tobacco production. This phenomenon suggests that the intensification of labor is quite advanced due to the application of modern equipment and agrotechnics in tobacco production. The average labor force engagement in the observed period and the dynamics of its noticeable decrease by decades is as follows: 1976-1986 - 63.026 co-operators, 1986-1995 - 48.385 co-operators, 1996-2005- 34.895 co-operators and 2006-2015 - 31.805 co-operators. This dynamics can also be represented through the following index of the engaged co-operators:

|  |  |  |
| --- | --- | --- |
| Decade | Co-operators | Index |
| 1976-1985 | 63.026 | 100 |
| 1986-1995 | 48.385 | 77 |
| 1996-2005 | 34.895 | 55 |
| 2006-2015 | 31.805 | 50 |

The intensity of tobacco production is even more evident through the index of co-operators engaged in this field. The number of co-operators is continuously decreasing, despite certain oscillations during this long period of time, which is primarily influenced by the natural conditions in tobacco plant growth. The fact is that the trend of intensification of this resource will continue in the following period. The intensity of tobacco production per engaged co-operator is presented in Table 4:

Table4.Production of tobacco by co-operators in the period 1976-2015 (kg)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1976 | 428 | 1986 | 436 | 1996 | 568 | 2006 | 790 |
| 1977 | 430 | 1987 | 496 | 1997 | 743 | 2007 | 622 |
| 1978 | 444 | 1988 | 409 | 1998 | 380 | 2008 | 512 |
| 1979 | 485 | 1989 | 561 | 1999 | 743 | 2009 | 594 |
| 1980 | 415 | 1990 | 424 | 2000 | 821 | 2010 | 643 |
| 1981 | 616 | 1991 | 619 | 2001 | 592 | 2011 | 613 |
| 1982 | 597 | 1992 | 587 | 2002 | 833 | 2012 | 962 |
| 1983 | 374 | 1993 | 446 | 2003 | 842 | 2013 | 731 |
| 1984 | 577 | 1994 | 532 | 2004 | 515 | 2104 | 728 |
| 1985 | 422 | 1995 | 633 | 2005 | 794 | 2015 | 668 |
| Average | 478 |  | 514 |  | 683 |  | 686 |

Source: Statistical Yearbook of SFR Yugoslavia, Association of Producers of R. Macedonia and Ministry of Agriculture, Forestry and Water Economy of R. Macedonia

The data show that tobacco production per co-operator was constantly increasing, so that in the last decade (2006-2015) it was almost 200 kg higher compared to the decade 1976-1985. In figures, tobacco yield per co-operator amounted from 478 kg in the decade 1976-1985, 514 kg in 1985-1995, 683 kg in 1996-2005 to 686 kg in 2006-2015. The index of the achieved production per co-operator is as follows:

|  |  |  |
| --- | --- | --- |
| Decade | Tobacco yield per co-operator (kg) | Index |
| 1976-1985 | 478 | 100 |
| 1986-1995 | 514 | 107 |
| 1996-2005 | 683 | 143 |
| 2006-2015 | 686 | 143 |

The data for the harvest of 2016 are not definitive yet, but so far they show further intensification of tobacco production per co-operator. According to these data, 23,000 tons of tobacco were produced by 29,122 co-operators in 2016, which is a yield of 789 kg tobacco per co-operator.

Compared to the decade 2006-2015, tobacco production per co-operator in 2016 was 103 kg higher. This further confirms the tendency of intensification of tobacco through the segment tobacco producer-co-operator, which is a result of the increased use of technique, technology and good cultural practices.

 **CONCLUSION**
All observed parameters involved in tobacco production in R. Macedonia for a period of four decades show a constant intensification, both in terms of planted area, yield per unit area, yield by co-operator and number of co-operators by years. This trend in tobacco production requires special analysis of the factors that have enabled such intensification in order to see what rationalization has been made in different stages and processes of production. The data and indices presented in the tables show that the process of intensification of tobacco production continues, with a tendency to increase in future.

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