

## INVESTIGATION ON THE PHYSICAL AND TECHNOLOGICAL INDICATORS OF THE BULGARIAN ORIENTAL TOBACCO ORIGINS

DIMITAR DRACHEV<sup>1</sup>, Nikolay Menkov<sup>2</sup>, Abdel Kerim Omar<sup>2</sup>

<sup>1</sup>*Tobacco and Tobacco Products Institute, Bulgaria, Plovdiv*

<sup>2</sup>*Higher Institute of Food and Flavour Industries, Bulgaria, Plovdiv*

### ABSTRACT

Physical and technological indicators of tobacco have an essential influence on tobacco quality, the conditions of storage and processing, the economic efficiency during the industrial processing and the cigarette industry. Investigated indicators were: burning ability, balancing humidity, specific volume, cigarette yield, content of ribs, number of leaves per kg, for two crops of the ori-

gins Dzhebel, Nevrokop, Krumovgrad, Melnik and East Balkan, of 1999 production year. Applied Standard methods per BDS were applied for determination of the indicators. Some data among the separate physical and technological indicators for Bulgarian oriental tobaccos of different quality grades were obtained.

### INTRODUCTION

The production of Oriental tobacco in Bulgaria is divided into separate regions which natural and agrotechnical conditions along with the varieties spread in them, specify the character and the quality of tobacco grown in them, i.e.

the peculiarities of tobacco origins.

Knowing of the specific physical and technological indicators, chemical composition, and smoking properties of separate origins is of great technological and economic importance.

### OBJECTIVE

Determination of physical and technological indicators of the origins Dzhebel, Nevrokop, Krumovgrad, East Balkan, Melnik in the produc-

tion year 1999 within systematic and thorough investigations on the Bulgarian Oriental origins.

### MATERIAL AND METHOD

Investigated origins were Dzhebel, Nevrokop, Krumovgrad, East Balkan, Melnik, quality and average quality material. When taking some material for analysis out of each origin and quality category, we set the aim for the latter be the average for a certain origin. That's why the trials were taken from the manipulation and fermentation enterprises at the moment when all the tobaccos were accepted from all the villages with view of the correct formation of the blend.

The trials were analyzed by the following indicators:

1. Number of leaves per kilogram (number) - determination was done after counting the leaves in a trial of 250 g, as the result was recalculated for 1 kg. tobacco afterwards.

2. Specific volume (cm<sup>3</sup>/g) - by means of Borgvald's apparatus, in 11 parallel trials, previously conditioned at relative humidity 58% and temperature 21°C.

3. Burning ability of tobacco (number of puffs/cigarette) - it was determined in the number of puffs per cigarette when puffing by autosmoker for analysis of the smoke.

4. Balancing humidity (%) - it was carried out by the method in Borgwald's chamber at relative air humidity: 58 %, 68 % and 80 %, on cut tobacco. To achieve the corresponding relative humidity of air, we used concentrated solutions of salts, namely NaBr, CuCl<sub>2</sub>, (NH<sub>4</sub>)SO<sub>4</sub>.

5. Content of ribs (%) in tobacco leaves - by the method of Gyuzelev, by mechanical grinding of dry leaves, in the course of which leaf

blades were ground and sifted through vibro sift with holes of 0.63 mm as the ribs set apart and attract.

6. Cigarette yield (number of cigarettes / kg tobacco) - it was calculated by the formula:

$$R = V / 3.0 * 1000 - z / (\text{number/kg})$$

where: V - specific volume, cm<sup>3</sup>/g

z - total amount of tobacco losses, g/kg

3.0 - volume of the standard cigarette- 3.0 cm<sup>3</sup>

## RESULTS

Experimentally determined values of separate physical and technological indicators from the two quality categories are as follows: /Table 1 and Table 2/

The burning ability of tobacco, determined as the number of puffs per cigarette, varies from 1223 to 14,2 puffs with grade I and from 13,0 to 15,2 with grade II.

Generally, the burning ability can be defined as slightly deteriorated for the studied production year.

Balancing humidity at relative air humidity 58%, with grade I varies within the limits 11,7% - 13,3%, and grade II from 11,22 to 13,4 %. At relative air humidity 68%, the balancing humidity with quality material is within the limits 14,72% - 16,06%, and with material of average quality - 14,76%-15,69%.

At relative air humidity 80%, the balancing humidity is within the range of 20,24% - 23,15%, for grade I and 20,15%-21,70% for grade II.

The content of ribs in the leaves varies within the limits 12,40% - 14,70 % for the whole quality range of the studied origins. It is small,

which is a characteristic for typical Bulgarian Oriental tobaccos.

The specific volume of tobacco leaves that, together with crumbs, determine the values of cigarette yield, varies within the limits 2,76 cm<sup>3</sup>/g to 3,24 cm<sup>3</sup>/g, for grade I and from 2,75 cm<sup>3</sup>/g to 3,15 cm<sup>3</sup>/g for grade II.

The cigarette yield varies within the limits 917 number of cigarettes per kilogram of tobacco up to 1077 number of cigarettes per kilogram tobacco, which confirms the good production efficiency of the studied Oriental tobaccos.

Number of leaves per kilogram tobacco is in direct ratio to the degree of labor consumption and especially the one related to picking, stringing, production manipulation and leaves sorting and in opposite ratio to leaf size. The values of the number of leaves in kilogram tobacco varies from 1068 to 2024, i.e. the difference is nearly double.

The highest number of leaves /2024/ was found in origin Dzhebel, and the lowest /1068-1072/ in origins Melnik and Nevrokop. The rest of the three origins are grouped within the average number of 1250.

## CONCLUSIONS

According to the physical and technological indicators, the studied origins Dzhebel, Nevrokop, Krumovgrad, East Balkan and Melnik, for 1999 production year, have the following characteristics:

A/ a certain enlarging - best performed with origin Dzhebel, but a small percent of ribs (12,4%-14,7%).

B/ similar and normal balancing humidity at relative air humidity 58% and 68% and with

border humidity beyond which there is a danger of growing mould (20%-22%), for the material of the two quality groups.

C/ a slightly deteriorated burning ability, over 10-11 number of puffs per cigarette - optimum accepted good burning ability.

D/ average /920-1080/ total technological and economic valuation, but similar cigarette yield, for the origins covered in the study.

It is obvious from the data and the pre-

Table 1 - Physical-technological indicators of tobacco grade I crop 1999  
Табела 1 - Физичко-технолошки показатели за тутунот од I класа, рек. 1999

| Origin - Сорта<br>Region - Регион | Balancing humidity<br>Рамнотежна влага |       |       | Specific volume<br>Специфичен<br>волумен | TCR         | Burning<br>num. of puff<br>per cigarette<br>Горење, бр.<br>на повлекув.<br>во минута | Num. leaves<br>per kg  | Rib         |
|-----------------------------------|--|-------|-------|--|-------------|--|------------------------|-------------|
|                                   | ( % )                                  |       |       |  |             |  | Бр. на лист.<br>во kg. | Глаз<br>реб |
|                                   | 58%                                    | 68%   | 80%   | g/cm                                     | num.cig./kg |  | num./kg                | %           |
| Dzhebel - Kardzhali               | 12,90                                  | 15,46 | 21,48 | 0,288                                    | 1029        | 12,9   | 2204                   | 14,         |
| Nevrokop - Gotse Delchev          | 12,20                                  | 16,06 | 22,41 | 0,310                                    | 952         | 12,2   | 1072                   | 12,         |
| Krumovgrad - Kardzhali            | 13,30                                  | 15,92 | 22,92 | 0,324                                    | 917         | 14,2   | 1458                   | 13,         |
| East Balkan - Yambol              | 12,80                                  | 15,84 | 23,15 | 0,320                                    | 926         | 13,0   | 1334                   | 14,         |
| Melnik - Sandanski                | 11,70                                  | 14,72 | 20,24 | 0,276                                    | 1072        | 13,3   | 1068                   | 12,         |

Table 2 - Physical-technological indicators of tobacco grade II crop 1999  
Табела 2 - Физичко-технолошки показатели за тутунот од II класа, рек. 1999

| Origin - Сорта<br>Region - Регион | Balancing humidity<br>Рамнотежна влага |       |       | Specific volume<br>Специфичен<br>волумен | TCR         | Burning<br>num. of puff<br>per cigarette<br>Горење, бр.<br>на повлекув.<br>во минута | Num. leaves<br>per kg  | Rib         |
|-----------------------------------|--|-------|-------|--|-------------|--|------------------------|-------------|
|                                   | ( % )                                  |       |       |  |             |  | Бр. на лист.<br>во kg. | Глаз<br>реб |
|                                   | 58%                                    | 68%   | 80%   | g/cm                                     | num.cig./kg |  | num./kg                | %           |
| Dzhebel - Kardzhali               | 12,50                                  | 15,69 | 21,70 | 0,279                                    | 1060        | 13,4   | 1772                   | 13          |
| Nevrokop - Gotse Delchev          | 11,65                                  | 15,52 | 21,67 | 0,287                                    | 1034        | 13,0   | 1294                   | 13          |
| Krumovgrad - Kardzhali            | 13,40                                  | 15,30 | 22,42 | 0,275                                    | 1077        | 14,6   | 1316                   | 14          |
| East Balkan - Yambol              | 12,23                                  | 15,04 | 22,16 | 0,290                                    | 1021        | 13,3   | 1473                   | 13          |
| Melnik - Sandanski                | 11,22                                  | 14,76 | 20,15 | 0,315                                    | 943         | 15,2   | 1118                   | 12          |

sented analysis that the Bulgarian Oriental tobaccos Dzhebel, Nevrokop, Krumovgrad, East Balkan and Melnik are characterized by well-expressed physical properties and technological

indicators, indicating a very good quality. These origins give commercial batches of high quality that are appreciated by the buyers.

## REFERENCES

1. Veselinov M., Gyuzelev L., 1964. Chemical-technological and smoking properties of the Bulgarian tobacco origins, Sofia.
2. Veselinov M., Gyuzelev L., 1965. Bulgarian tobacco origins with view of commerce and technology, First symposium on tobacco, Bulgaria, Plovdiv, 5-12 September.
3. Gyuzelev L., 1983. Tobacco commercial study, Plovdiv.
4. Gyuzelev L., 1960. Establishing of objective indicators of the most important properties of the Bulgarian Oriental tobaccos, Dissertation, Plovdiv.
5. Drachev T., 1956. Study on the burning ability of the Bulgarian Oriental tobaccos, Bulgarian tobacco, 3.
6. Timev A., Veselinov M. etc., 1974. Oriental tobacco in Bulgaria, Sofia.
7. Tomov N., 1973. Dependence between the soil-climatic conditions and some technological properties of tobacco, Bulgarian tobacco, 12.
8. Tomov N., 1975. Physical and technological qualities of the leaves with some local varieties, Bulgarian tobacco, 1.

## ПРОУЧУВАЊЕ НА ФИЗИЧКИТЕ И ТЕХНОЛОШКИТЕ ПОКАЗАТЕЛИ НА БУГАРСКИТЕ ОРИЕНТАЛСКИ СОРТИ ТУТУН

**Димитар Драчев, Николај Менков**  
*Институт за тутун и тутунски преработки*  
*Пловдив, Бугарија*

Физичките и технолошките показатели на тутунот имаат суштинско влијание врз квалитетот на тутунот, условите на чување и преработка, економската ефективност за време на индустриската преработка и индустријата на цигари. Проучувани се индикаторите како способноста за горење, рамнотежата на влажност, специфичниот волумен, приносот на цигари, содржината на ребро и бројот на листови на кг кај три реколти од тутуните џебел, неврокоп, крумовград, мелник и источен балкан. Применети се стандардни методи по БДС или ИСО за одредување на овие индикатори. Добиени се некои податоци и назначена е корелативната зависност меѓу одделни физички и технолошки показатели за бугарските ориенталски тутуни од различни квалитетни класи.

*Author's address:*  
*Dimitar Drachev*  
*Tobacco and Tobacco Products Institute*  
*Plovdiv, Bulgaria*