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INFLUENCE OF CHEMICAL COMPOSITION ON BURN FREE OF BURLEY TOBACCO

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Abstract

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Because of the specific structure and smoking properties Burley tobacco finds a wide application. Studies in technological, chemical and the smoking properties of Burley tobacco show that between them there are a number of dependencies. The aim of the research is a comparative analysis of indigenous and introduced varieties, and consolidated Byrley tobacco lines to determine the influence of chemical composition on burn free. Using standardized methods for analysis and data processing is a proven link between burn free and the most important chemical parameters in burley tobacco. The influence of nicotine and total nitrogen is positive on burn free in Burley tobacco as sugars and ammonia have a negative impact. A strong positive correlation was observed between burn free and ash content and negative between burn free and chlorine content. Protein content was independent of burn free of tobacco. Balanced chemical composition in Burley tobacco is a prerequisite for better burn well.

Key words: Burley tobacco, burn free, burning rate, chemical composition, nicotine, sugars, ashes, ammonia, chlorine

Introduction

Burley tobacco is an indispensable component not only in blends of cigarettes, but in almost all tobacco products (Lewyn, 1979). Due to the specific structure and properties of smoking finds a wide application (Bridges et al, 1994; Bozukov, 2012). They are the basis of user properties (Tomov and Minev, 1996).

Research on technological, chemical and the smoking properties of Burley tobacco show that between them there are many dependencies (Drachev, 1994). Knowing they could contribute to success both in the breeding work and to improve the quality level of tobacco (Kirkova, 2005).

The burn frees of tobacco as an indicator expresses is its ability to smolder evenly (Gyuzelev and Peeva, 1984). Burn free provide the necessary conditions for the proper functioning of redox processes, respectively, the composition of the smoke underpinning the smoking properties (Popova et al., 2006).

The ability to burn is directly dependent on the chemical composition; the higher proportions of minerals, especially potassium salts have a positive effect (Boneva, 1979). Higher content of organic matter worse burn free (Boneva, 1979).

Essential for the chemical composition of Burley tobacco to form consumer value are: nicotine, total nitrogen, sugars, ash, ammonia, chlorine and proteins (Tso, 1989; Nicolic et al., 1995; Davis and Nielsen, 1999).

The aim of the study was to determine the influence of chemical composition on burn free on indigenous and introduced varieties and consolidated lines Burley tobacco.

Material and Methods

Experimental work was carried out in educational and experimental field of TTPI – Markovo the period 2009–2010. We used two varieties developed at Tobacco and Tobacco Products Institute – Burley 1317 variety and Burley 1344 variety; perspective consolidated eight lines; Line 1354; Line 1362, Line 1365, Line 1374, Line 1382, Line 1386, Line1393, Line 1399; five varieties introduced from USA: Burley 21, Tennessee 86, Tennessee 90, Kentucky 907

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and Kentucky 908. The chosen options are proven economic characteristics – production and percentage of class.

For all options is attached uniform growing technology. Harvesting of tobacco as whole plants in late August and air dried in the dryer base TTPI. For analysis and processing of data are used standardized methods.

Results and Discussion

The burn free is the ability to burn without air intake in cigarette. The results obtained for burn free in the tested variants and presented in Table 1 show that with the best burn free is Burley 1344 variety followed by Line 1354. In all other variants the results are satisfactory.

Table 1
Data of burn free of the investigated variants

Variant	Burn free in minutes	Burning rate in mm of minute
Burley 1317	6.89	6.11
Burley 1344	5.18	5.28
Line 1354	5.42	5.57
Line 1362	6.22	6.06
Line 1365	7.84	6.72
Line 1374	6.41	6.19
Line 1382	7.51	6.63
Line 1386	6.27	5.76
Line 1393	6.56	6.37
Line 1399	5.96	5.78
Burley 21	6.19	6.25
Tennessee 86	7.81	6.92
Tennessee 90	7.13	6.7
Kentucky 907	7.36	6.98
Kentucky 908	6.87	6.44

The burning rate is a function of the burn free. It is higher in variants with good values of burn free. In the case of the best results is the Burley 1344 variety, followed by Line 1354 (Table 1).

Other lines and varieties are relatively good data on this indicator. When introduced varieties, as compared with the local lines and varieties, the values are low.

Burley tobacco is from the tobaccos with high nicotine content. The content of nicotine in Bulgarian Burley tobacco must not be lower than 2.5%.

The results of research for basic chemical parameters presented in Table 2 show that the highest nicotine content features Burley 1344 variety, Line 1354 and Line 1374 and of introduced varieties – Ky908. Other results the variant are satisfactory in terms of the standard Burley tobacco.

Observed is relatively unidirectional trend in almost all the variant and in particular to increase the values for nicotine is increased and the values of burn free.

Burley tobacco is characterized by low values for sugar content (0.7–1.0%).

The studied variants with the lowest sugar content are distinguished Burley 1344 variety and Line 1354 (Table 2). The highest values have the introduced varieties. When this indicator is observed inverse correlation – the higher values for sugar content, the lower are burn free.

On the basis the obtained results it can be argued that in the studied variants the sugar content adversely affect the burn free. It is desirable that the content of total nitrogen in Burley tobacco to be above 2.5%. In tested variants with the highest content of nitrogenous substances are reported in Burley 1344 variety, Line 1354, Line 1374 and Ky 908 (Table 2).

Table 2
Data of chemical composition of the investigated variants

Variant	Nicotine	Sugars	Total nitrogen	Ashes	Ammonia	Chlorine	Proteins
B 1317	2.46	1.13	2.74	16.35	0.33	0. 38	9.87
B 1344	3.62	0.68	3.58	19.24	0.28	0.32	7.82
Line 1354	3.36	0.72	3.46	19.02	0.29	0.33	8.06
Line 1362	2.77	0.89	3.11	17.71	0.32	0.35	10.83
Line 1365	2.13	1.22	2.5	15.22	0.37	0.42	9.13
Line 1374	3.19	0.9	3.33	18.14	0.3	0.37	10.76
Line 1382	2.68	1.09	2.87	15.77	0.36	0.41	10.62
Line 1386	2.96	0.85	3.15	17.5	0.34	0.38	8.88
Line 1393	2.44	0.94	2.66	17.85	0.34	0.38	9.15
Line 1399	3.02	0.82	3.18	18.7	0.31	0.35	8.12
Burley 21	2.73	0.81	3.13	17	0.33	0.35	9.27
Tn 86	2.12	1.28	2.39	15.31	0.38	0.42	10.71
Tn 90	2.31	0.79	2.8	18.08	0.35	0.37	9.16
Ky 907	2.07	1.15	2.44	16.23	0.38	0.4	10.17
Ky 908	3.1	0.98	3.25	16.46	0.36	0.36	9.84

Although in this case the relationship is not unidirectional and strong, can be clearly determined depending in most options – the better values for burn free are at a higher total nitrogen content.

In our study sample Burley tobacco is an association between the ash content and burn free. The higher the greater the ash content, the better are the results for the burn free. Tobacco Burley type is characterized by high levels of ammonia (to 0.3%). Only in Burley 1344 variety, Line 1354 and Line 1374, the results are in the expected rates (Table 2). In the introduced varieties values are increased. Generally is no defined trend. In most variants of the content of ammonia is adversely affects the burn free. It could be assumed that ammonia content has an adverse influence. Typical values for the chlorine content in Burley are below 1.0%. Test variants fit into these expectations except introduced varieties (Table 2). They observed unusually high values.

From the results it is evident a strong trend, i.e. the higher content of chlorine the worse burn well. Typical of Burley tobacco is the protein content does not exceed 10–12%. Test options fit within this range (Table 2). Can not be reported a pattern of links between protein content and burn free.

Conclusion

As a result of the study can be summarized that the best values on complex indicators are Burley 1344, Line 1354 and Line 1374. Line 1374 low-grade retreats from Line 1354. It is clear that most of the studied variants fit into conventional standards for burley tobacco. Introduced varieties retreated significantly from indigenous varieties and lines. The exception is only partly Ky 908 variety.

The trends observed between indicators confirm the close relationship between the chemical composition of tobacco and burn free. Most pronounced at a burn free and the ash content – positive, as in burn free and chlorine content – negative. Less clear is when burn well and the content of nicotine – positive and burn free and sugar content – negative. There is a weak connection between burn free and content of nitrogenous substances – positive and burn well and ammonia content – negative.

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