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SHORT AND OTHER CORN DISEASES

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In the previous years, the diseases encountered in corn most often were the rotting of the sown seeds and of the sprouts, blister smut, bacterial, anthracosis and white-ear disease. Gray rot developed less intensively. The blights were caused by a complex of microorganisms and also diplodia disease and rusts had a limited occurrence.

The rotting of the seeds and sprouts was caused by fungi of the genera *Fusarium* and *Fusarium*. Owing to a late spring it was less severe than usually in most of the regions. An appreciable development of the disease was observed in Siberia (Omskaya and Tomskaya oblasts and Altayskiy Kray) and also in Dnepropetrovskaya (5.2-15.5%) and Voronezhskaya (1.1-4.15) oblasts, in Sverdlovskiy Kray (0.3%) and other regions of the USSR. Cases of severe rotting of the seeds were observed in Kievskaya Oblast in the hybrid Bukovinskiy 3 (up to 27.6%). The low-quality and poorly treated seeds molded very easily. An improvement in the quality of the treatment at the plants may sharply reduce the manifestation of the disease in the following year.

Blister smut (*Ustilago maydis* Corda.) gained considerable occurrence.

The data according to zones are given in the article by G. E. Farkharova (see page 147).

Ecological conditions for the development of the disease were favorable in 1961. Arid weather in the first half of the vegetation which changed to a wetter period in the second half contributed to an increase of the blight smut in many regions (Table 1).

According to the data of All-Union Scientific Research Institute for Corn Research and its network and also according to the data of the object experiment stations of Ukrainian SSR the highest number of the attacked plants was observed in Poltavovskaya Oblast in the hybrid Lukovinskiy 3 and the kolkhozes "Peremoga" in Lubenskiy Rayon (22.3%) and "Druzhba" in Dilman'skiy Rayon (2.0%), and somewhat less in some kolkhozes in Chernovitskaya (11.5%) and Zhitomirskaya (12.0%) oblasts. In RSFSR [Russian Soviet Federated Socialist Republic] the disease sharply increased in Arkhangel'skaya ASSR and Khbardino-Ballar ASSR (up to 70% of the diseased plants), in Saratovskaya (up to 6%), Moscow (up to 13%) and Ivanovskaya (up to 12%) oblasts. Isolated attacks on the plants were encountered in other localities.

The preservation of high viability of the smut spores in the galls toward the beginning of the corn harvesting in many zones indicates that with favorable ecological conditions the development of the disease may increase next year, especially in the regions with a large reservoir of infection.

The loose smut (*Sporosporium reilianum* LeAlpine) was seldom encountered on corn forms owing to the adoption of a centralized treatment of the

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Table 1

(1) Республика, край, область	(26) Сорт или гибрид	(36) Средневзвешенный процент поражения
(1) Киевская обл.		15,3
(2) Полтавская обл.		12,3
(3) Житомирская обл.		19,0
(4) Черниговская обл.		9,2
(5) Тернопольская обл.		9,0
(6) Винницкая обл.	Буковинский 3 (27)	8,3
(7) Черновицкая обл.		6,5
(8) Хмельницкая обл.		5,5
(9) Киевская обл.		3,0
(10) Киевская обл.		2,3
(11) Киевская обл.		0,7
(12) Николаевская обл.		3,6
(13) Одесская обл.		2,7
(14) Одесская обл.	ВМР 42 (28)	2,5
(15) Одесская обл.		2,5
(16) Одесская обл.		1,7
(17) Кировоградская обл.		1,2
(18) Сумская обл.	Киевский 8 (29)	1,8
(19) Пензенская обл.	Днепропетровский 56 (30)	4,4
(20) Пензенская обл.	Ракета (31)	2,2
(21) Волгоградская обл.	Буковинский 2 (32)	2,2
(22) Воронежская обл.	ВМР 117 (33)	0,4
(23) Закарпатская обл.	ВМР 42 (28)	4,6
(24) Ставропольский край	Буковинский 3 (27)	5,0
(25) Грузинская ССР	Кремнистая белая (34)	7,5
	Алмазетская белая (35)	2,0

Key to Table 1: 1, Republic, kray or oblast; 2) Poltavskaya Oblast; 3) Kievskaya Oblast; 4) Zhitomirskaya Oblast; 5) Chernigovskaya Oblast; 6) Ternopol'skaya Oblast; 7) Chernovitskaya Oblast; 8) Chernigovskaya Oblast; 9) Hmel'nitskaya Oblast; 10) Vin-nitskaya Oblast; 11) Volynskaya Oblast; 12) Rovenskaya Oblast; 13) Nikolayevskaya Oblast; 14) Tagan'skaya Oblast; 15) Dnepro-petrovskaya Oblast; 16) Odeskaya Oblast; 17) Zaporozhskaya Oblast; 18) Kirovogradskaya Oblast; 19) Sum'skaya Oblast; 20) Pen-zen'skaya Oblast; 21) Volgogradskaya Oblast; 22) Voronezhskaya Oblast; 23) Zakarpatskaya Oblast; 24) Stavropol'skiy Kray; 25) Georgian SSR; 26) Variety or hybrid; 27) Bukovinskiy 3; 28) VMR 42; 29) Kievskiy 8; 30) Dnepropetrovskiy-56; 31) Raketa; 32) Bukovinskiy 2; 33) VMR 117; 34) Kremnistaya belaya; 35) Ad-mamet'skaya belaya; 36) The average weighted percentage of the disease.

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seeds at the corn processing mills. Not more than 0.4-0.7% of the plants were attacked in the crops of the steppe zone of the Ukraine and in a number of regions of RSFSR. A high rate of the disease was observed in the separate fields, for example at the Kolkhoz imeni Zhdanov (3.8%) and at the Kolkhoz imeni Michurin (2%) in Kagarlykskiy Rayon of Kievskaya Oblast (see the articles by T. I. Zakharova), and also in Ryazanskaya Oblast, in North Ossetian ASSR and Checheno-Ingush ASSR (4-7%). Because of the high rate of the affection of corn by the loose smut it is necessary to tighten up the quality control of the seed treatment.

The corn stalk diseases are caused chiefly by species of the genera *Fusarium* and *Sclerotium*. In most of the regions the stalk rots were observed in an insignificant amount. The decline of the disease was helped by favorable conditions for the growth and development of the plants in the second half of the vegetation. Thus, in Dnepropetrovskaya Oblast not more than 0.4-2.0% of the plants were affected in the production-scale sowings of the hybrid VIR 42 as compared with 17% in 1963.

The intensity of the disease development depends in many respects on the degree of the resistance of a variety or hybrid. Thus, while in the separate numbers of the sweet corn the diseased stalks amounted up to 30-50%, in the varieties Risovaya 645 and Grushevaya 380 they amounted up to 19% and 17% respectively.

Breaking and lodging of the plants — characteristic symptoms of *Fusarium* stalk rot — were observed in isolated cases in Nikolayevskaya, Kievskaya and Voronezhskaya oblasts. The possibility is not excluded that under the conditions more favorable for the development the disease will progress in the repeated plantings.

Table 2

THE PERCENTAGE OF THE CORN EARS
ATTACKED BY DISEASES IN 1964

(1) Место проведения учета	Сорт или гибрид (12)	(27) Всего пораженных початков	(28) том числе поражено болезнями					
			(29) фузариоз	(30) нигроспора	(31) серая гниль	(32) бактериоз	(33) белая	(34) плесневелость
(2) Днепропетровская обл.	ВИР 42 (13)	33,5	4,0	0	0	25,0	13,2	10,0
	Днепропетровский 90 (14)	23,8	3,8	2,8	0	6,2	11,3	12,3
	Пламя (15)	7,7	1,5	0	0	0,2	0,2	3,5
	Ракета (16)	27,6	0,4	6,0	0	11,2	19,0	8,5
	Днепропетровский 98 (17)	26,0	28,4	0,4	0,8	10,8	14,5	7,0
(3) Одесская обл.	Рисовая 645 (18)	29,3	10,3	3,6	0	2,5	11,0	7,4
	ВИР 42 (13)	10,4	21,6	0,4	—	25,3	20,8	8,9
(4) Киевская обл.	Буквинский 3 (19)	52,7	19,1	1,9	3,8	30,8	19,3	—
	Глория Янецкого (20)	61,0	53,7	3,4	4,9	32,0	24,3	—
	Киевский 8 (21)	38,4	27,9	2,2	1,1	6,7	26,2	—
(5) Волгоградская обл.	Днепропетровский 98 (17)	51,1	3,9	—	—	46,2	10,9	2,7
	Ракета (16)	28,4	0,8	—	—	27,4	5,8	1,0
(6) Ставропольский край:								
(7) восточная зона	ВИР 42 (13)	41,0	5,0	1,0	—	19,0	4,0	8,0
(8) центральная зона	ВИР 42	63,0	19,0	0	—	37,0	4,0	10,0
(9) Грузинская ССР:								
(10) восточные районы	Картули Круги (22)	—	6,4	8,0	—	1,9	0,7	0,4
	Картули 1 (23)	—	7,8	5,5	—	1,6	2,2	0,7
	Имеретинский (24)	—	4,5	1,6	—	1,1	1,3	0,3
	Кремнистая белая (25)	—	2,0	1,5	—	1,0	1,2	0,7
(11) западные районы	Аджаметская белая (26)	—	2,8	5,0	—	0,9	0,3	0,8

Key to Table 2: 1) The locality where the count was made; 2) Dnepropetrovskaya Oblast; 3) Odesskaya Oblast; 4) Kievskaya Oblast; 5) Volgogradskaya Oblast; 6) Stavropol'skiy Kray; 7) Eastern zone; 8) Central zone; 9) Georgian SSR; 10) Eastern regions; 11) Western regions; 12) Variety or hybrid; 13) VIR 42; 14) Dnepropetrovskiy 90; 15) Plamy; 16) Raketa; 17) Dnepropetrovskiy 98; 18) Risovaya 645; 19) Bukovinskiy 3; 20) Gloriya Yanetskogo; 21) Kievskiy 8; 22) Kartuli Krugi; 23) Kartuli 1; 24) Immerotinskiy hybrid; 25) Kremnistaya belaya; 26) Adzhmetskaya belaya; 27) The total of the attacked ears; 28) Including those attacked by the following diseases; 29) Fusariosis; 30) Nigrospora cob rot; 31) Gray rot; 32) Bacteriosis; 33) White-ear disease; 34) Molding.

Fungi of the genera *Helminthosporium* and *Nigrospora* were observed in the steppe zone of the Ukraine. They had not been observed here before.

Diplodia dry rot (*Diplodia zeae* Lev.) and the red stalk rot (*Gibberella zeae* Sacc., *Sclerotium bataticola* Taub) had a limited occurrence in Georgia only in the regions with a plentiful amount of precipitation

... In the western regions the development of the disease remained at the 1963 level; damage to dry rot attacked from 14.5% to 19.0% of the plants and the red stalk rot -- from 7.5% to 9.5%. In the eastern regions the attack of the stalks by the red rot increased to 7%. This was connected with a large amount of precipitation in August and September in comparison with the same period in 1963.

Brown spot (*Physoderma maydis* Mayb.) was observed only in Georgia. The incidence was from 2.5% to 22.5% in the eastern regions of this Republic and up to 10-12% in the western regions.

Stem rust (*Puccinia sorghi* Schw.) gained appreciable development in Georgia. Plants having the disease symptoms were observed most of all (from 15 to 65%) in the eastern regions. The degree of the infection by the disease varied from 15% to 68%. In Vinnitskaya and Volynskaya oblasts the plants affected to a slight degree amounted to from 2% to 6%.

Isolated plants with the fungus pustules were observed in Khmel'nitskaya, Cherkasskaya, Luganskaya, Ternopol'skaya, Kievskaya, Chernomorskaya and Dnepropetrovskaya oblast and also in Voronezhskaya Oblast on the sections located on the bottom land of the Don River. The disease was not detected in Zakarpatskaya, Rovenskaya, Chernovitskaya, Zhitomirskaya, Cherkasovskaya, Sumskaya, Zaporozhskaya, Kirovogradskaya, Krymskaya, L'vovskaya, Nikolayevskaya and Volgogradskaya oblasts and in Stavropol'skiy Krai.

Helminthosporium corn leaf blight (*Helminthosporium turcicum* Pass.) usually occurs in the south of the Ukraine, in Northern Caucasian and in the Transcaucasian region. In 1964 the disease developed very intensively in the middle western regions of Georgia. In the late and after-harvest sowings not infrequently one out of every 10-12 plants would prove to be

... by the following widely occurring
... : *Fusarium verticilliforme* Sclod., *Nyctospora oryzae* Fetch.,
... in and *Diurinus maculiferus* valgetus Flügge (Table

... weather at the end of corn vegetation in the Ukraine con-
... an increase of fusariosis, nyctospora cob rot, white-ear dis-
... and the molding of the ears. An increase of fusariosis was also ob-
... in the central regions of Stavropol'skiy Kray and of the white-ear
... in Voronezhskaya Oblast (up to 1.5% in the hybrid Bukovinskiy 2).

A decline of bioteriosis was recorded in the Ukraine and a decline
of fusariosis and white rust -- in the Volga region. Diplodia ear rot (up
to 1.2%) and the red ear rot (up to 6.5%) were recorded only in Georgia.

Observance of the agricultural-engineering methods aimed at the
destruction of the infectious matter, the sorting and grading of the seeds
and also a high-quality treatment of them will contribute to a decline of
the corn diseases and to a decrease of the crop losses from them.

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