

selfs of homozygous $c_2 c_2$ in in give all dilute kernels. Acid tests, even on $c_2 c_2 c_2$ In in in, are negative on visually colorless types. This is therefore a new example of a 13:3 interaction. Further observations on plant color show that c_2 does affect this character: $c_2 c_2$ B Pl plants have much reduced pigmentation in the husks and sheaths but intensely-pigmented auricles, glume bars, and similar tissues.

-- E. H. Coe, Jr.

5. A sector for brittle stalk-2.

In a progeny segregating for bk_2 , one individual was almost perfectly split into half brittle-half normal. Almost all of the leaves were divided at or near the midrib into brittle and normal and the tassel had very nearly half brittle and half normal branches. Whatever the basis for brittleness it therefore appears to be cell-limited and, since the bk_2 sector was virtually equal in size to the normal, bk_2 must not affect the competitive ability (cell division and growth) of tissues carrying it to any great extent.

-- E. H. Coe, Jr.

NATIONAL INSTITUTE OF AGRICULTURAL SCIENCES
Department of Physiology and Genetics
Hiratsuka, Japan

1. Maize races native to the island Kiushiu situated at the southern part of Japan.

The old Japanese corn races have three centers of distribution which occupy upland areas on the mountain sides of Mt. Fuji, Shikoku and Kiushiu and which range from 300 to 1,000 m in altitude. All of the races were shown to belong to a Caribbean type of tropical flint corn. In addition, detailed studies have been carried out from morphological and cytological viewpoints. Some data obtained from the races native to two centers, Mt. Fuji and Shikoku, have already been presented in previous volumes of this News Letter MGCNL 31:105-107, 32:105-107 and 33:84-88. The present study deals with native races from the last center, Kiushiu. In autumn of two years, 1956 and 1958, a large collection of races growing in Kiushiu was made. It was obtained from 200 or more farmers at 65 places and consisted of 300 or more samples. In 1959, 62 of these samples were chosen and grown at three agricultural experiment stations, Iwate, Hiratsuka and Ehime. The same measurements or observations as those mentioned in the previous reports were carried out. Results obtained can be summarized in table 1 on the following page.

(1). For about 300 samples collected, 70 local racial names were encountered. Actually, only 43 distinct races were identified. Of these, 15 races were certainly worth noting from the breeding viewpoint (Table 1). The 43 races were grouped into 11 types (Table 1). Four types were worth considering for breeding purposes. (a) the Oodama type comprises the late races with heavy grain yield, (b) the Shinboso type is superior in grain quality to the other types, and (c) the Kanazuchi and Okuzuru types have a combination of the attributes just mentioned with the former being medium and the latter early in maturity.

(2). The racial differentiation was remarkable in the majority of 68 characters examined. Eighteen attributes were especially useful in identifying any race or type. They consisted of characters concerned with maturity, plant height, stalk diameter, number of stalk nodes, leaf size, ear height,

Table 1. Comparison of 10 attributes of 11 types of the old races native to the island Kiushiu.

Name of type	No. of races	Maturity	Plant height	No. of leaves	Leaf size	Ear height	Kernel rows	Ear weight	Kernel color	Place well-adapted	Race noticed
1. Oodetchi	3	very late	high	many	large	high	14-18	heavy	pale orange	low land in mountain	Tonegawa, Aso No. 1
2. Kanazuchi	5	late	"	"	"	medium	14-16	common	orange	"	Kanazuchi, Mejiro, Torinosu
3. Nakadama	5	"	medium	medium	medium	"	"	"	"	"	-
4. Shinboso	3	"	"	"	"	"	12-14	heavy	dark orange	"	Shinboso, Yamasanga, Yamanguchi
5. Okuzuru	6	very early	"	few	"	somewhat low	8-12	common	"	high land in mountain	Okuzuru, 8-retsu wase, Hattôkibi
6. Hayadama	3	early	low	"	small	low	10-14	light	"	"	Hayadama, Kijiyama
7. Ohi-wase	1	"	"	"	"	"	14-16	common	"	"	-
8. Kirishima	4	medium or late	somewhat low	many	medium	medium	14-20	light	yellow	terrace on coastal hill	Nobeoka-zairai
9. Shimabara	2	"	"	"	small	"	14-16	"	"	"	Shimabara-zairai
10. Benkei	8	early or late	"	medium	medium	"	14-24	"	"	all areas	-
11. Pop-like	2	medium or late	low	many	small	high	16-20	"	"	coastal area	-

number of husk leaves, ear exertion, ear length, ear diameter, number of ears, ear weight, number of kernel rows, number of kernels per row, kernel size, kernel weight, tassel length and number of tassel branches. Furthermore, some attributes were remarkably sensitive to the climatic difference in the 3 experimental stations, Iwate, Hiratsuka and Ehime. They were maturity, stalk height, stalk diameter, tillering, prop-rooting, number of green leaves, number of ears, cob diameter, cob weight and kernel weight.

(3). The genetical uniformity of the characters of a race was dependent on the degree of topographic isolation, the diversity of corn cultivation by the farmer, the climatic difference in the growing area and the care of farmers in their seed selection. In accordance with such differences, 65 corn-growing localities could be grouped into 25 areas, Kokonoe, Tsue, Kujû, Asaji, Ogi, Namino, Oguni, Asodani, Shiramizu, Kusakabe, Mamihara, Noziri, Gokasho, Kuwanouchi, Takachiho, Nobeoka, Saigô, Morozuka, Shiiba, Mera, Yuyama, Itsuki, Kirishima, Shibushi and Shimabara. In 8 areas Kokonoe, Tsue, Noziri, Kawanouchi, Morozuka, Shiiba, Nobeoka and Shimabara, there were distinct races with uniform characters, any one of which was rather small in its variability. In 6 other areas, Asaji, Kujû, Ogi, Itsuki, Kirishima and Shibushi, races were more heterogeneous in character. Lastly, the remaining 11 areas were intermediate between the above two cases in their intra-race variability.

(4). The knob analysis of the pachytene chromosomes has been carried out. Data obtained from 67 samples are given in Table 2. The B chromosome was not met with, as seen in the native races in Shikoku. In every race, 5 arms with knobs were always observed: 3L, 5L, 6L, 7L and 8L. Accordingly, it seems that those knob positions should be considered as a fundamental characteristic of the Caribbean flint growing in Japan. In addition, the old races distributed in Kiushiu were characterized by having three marked peculiarities in knob position. As compared with old races native to the other two centers, the races in Kiushiu tended to have a very high occurrence of the knobs on 10L and 2L, giving an average of 0.7 and 0.8 respectively. Another peculiarity was the occasional loss of the second knobs on 6L and 8L, resulting in an average of 1.5 and 1.9 respectively, because the first knobs on 6L and 8L existed in every race. Lastly, the occurrence of knobs on 1L, 4L, 7S and 9S was very low, the frequency varying from 7 to 14 percent. However, their presence or absence was very important in the identification and relationship of the race, in accordance with which the number of knobs varies. The variability of knobs was, however, not as great as that seen in the other two centers. Average number of knobs was computed to be 8.8, ranging from 7 to 12. On the whole, it may be said that a decrease in knob number in a given race should be associated with earliness; the more knobs a race has, the later it becomes. On the other hand, it may also be said that an increase of knob number should be considered as an index of contamination by Japanese old pop corn, because the pop races native to Japan had more knobs than the pure races of Caribbean flint distributed in the same area.

-- T. Sutô

NORTH CAROLINA STATE COLLEGE
Raleigh, North Carolina
Department of Genetics

1. Genetic and genotype x environmental interaction variances in an open-pollinated variety of corn.

This experiment was designed to estimate the magnitude of components of genotype x environmental interaction variance relative to genetic variance. Sixty half-sib families of the Jarvis variety