

# Deciduous Character of Pepper

tiny fruited form is crossed with non-deciduous variety to get easy-to-pick pepper for commercial use

Paul G. Smith

**Deciduous ripe fruit character** in peppers, which allows the fruit to be picked while the stem remains on the plant, was inherited in a cross of a tiny fruited Chili Piquin with large but non-deciduous varieties.

Virtually all varieties of the common cultivated pepper, *Capsicum annuum*, are non-deciduous: the ripe fruit adheres tightly to the calyx, so that the calyx and most or all of the stem remain attached to the fruit when picked. Because of the high labor costs in removing the stems from the pods, most of the cayenne or red pepper, paprika and chili powder manufactured in the United States is made from non-stemmed pods. The presence of this woody tissue in the ground powder is economically unavoidable but it lowers the quality and color of the product.

Among a large number of Mexican varieties a tiny fruited wild form called Chili Piquin—Ac. 635—was found to have fruit which separated readily from the calyx when ripe. The fruits are easily picked, while the stem remains on the plant. This character promises to be of value in the problem of economical removal of the stem tissue.

This deciduous fruit character was found in three other wild pepper varieties Ac. 907, 908, and Ac. 957. All four varieties have fruit not over one half inch long. The deciduous character is not

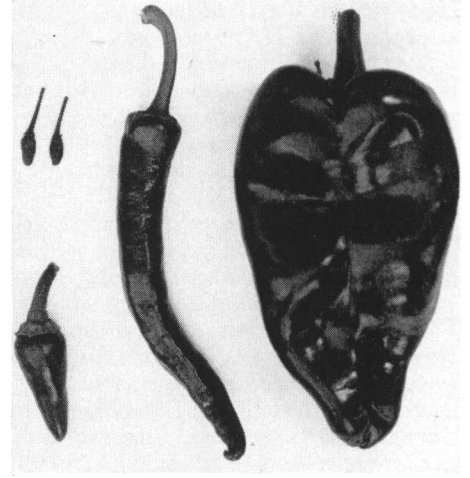
found in any of the larger fruited cultivated varieties.

To determine the inheritance of this character and to incorporate it into varieties suitable for commercial use, Chili Piquin was crossed with the non-deciduous Mexican Chili variety. The crossbreds of the first generation— $F_1$ —was selfed, backcrossed to each parent, and outcrossed to California Chili, which is also non-deciduous.

The results show that the deciduous character in *C. annuum* is inherited as a single dominant gene.

In the segregating populations there are definite differences among deciduous plants in the tightness of the fruit to the stem. Many, including the Chili Piquin parent, have fruit which fall at a light touch, while others require some pull. The latter condition is of more value in breeding because of the danger of fruit dropping as a result of wind or other plant disturbances if the fruits are too easily separated from the stems.

Limited evidence indicate that the deciduous character is dominant in several other species of *Capsicum* which are rarely seen in this country. In the following crosses involving both alleles, *C. frutescens*  $\times$  *C. frutescens*—Tabasco  $\times$  Ac. 902—*C. frutescens*  $\times$  *C. annuum*—Tabasco  $\times$  Long Red Cayenne—*C. frutescens*  $\times$  *C. pendulum*—Tabasco  $\times$  Ac. 911—and *C. chacoense*  $\times$  *C. annuum*—



The fruit of Chili Piquin, upper left, is dwarfed by its cultivated relatives, Floral Gem, lower left, Long Red Cayenne, center, and Mexican Chili, right.

Ac. 689  $\times$  Long Red Cayenne—all crossbreds of the first generation were deciduous.

All these other species are very difficult to hybridize with the cultivated pepper, so that Chili Piquin and the other wild forms closely related to it remain the best source of the deciduous gene.

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The above progress report is based on Research Project No. 906.

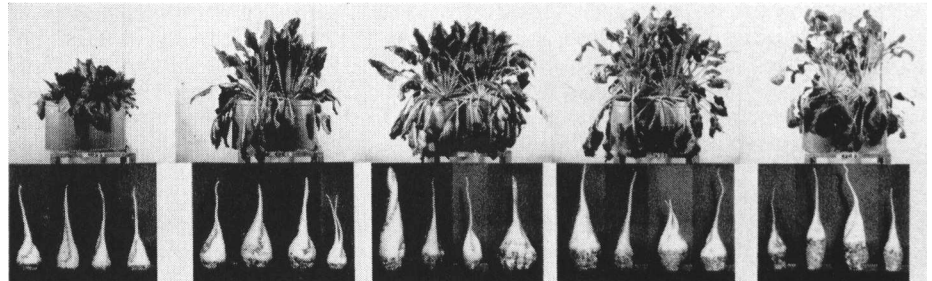
## CLIMATE

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of growth prevail. Only when the utilization of sucrose is decreased without curtailing sucrose synthesis—such as when beets become nitrogen deficient—that the beet root will accumulate sucrose to a high concentration. Other mechanisms for effecting sucrose accumulation may

**Effects of night temperature on beet growth.** The beets from left to right were grown in sunlight for eight hours (8 a.m. to 4 p.m.) at 73° F followed by dark periods of 16 hours at 36° F, 50° F, 63° F, 73° F and 86° F. The highest sucrose concentration was found at the lowest night temperature while the highest root weights and sucrose yields were observed for the intermediate night temperatures. The beets in these experiments were grown in vermiculite and watered daily with a complete nutrient solution.

also occur in the beet plant, and one of the objectives of future experimentation will be to find them. A better understanding of the factors affecting sugar beet growth may have an important bearing on the effectiveness of the beet sugar industry to maintain its competitive position in the years to come.



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