

A TOMATO MUTANT

by

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With tab. VIII.

In the summer of 1921 I paid a visit to Mr. A. Vergeer the dean of Wognum, who had won a new variety of tomatoes with exceedingly big fruits and „undivided” leaves of which he had sent a sample to Wageningen. It had arisen in his Alice Roosevelt as one single plant. The term „undivided” for the leaves was highly exaggerated as the leaf really is a compound one, but in fact the leaflets are less incised than those of the common types or sometimes even not at all. Only the first leaf of the seedlings might be called so.

Dean Vergeer has been kind enough to send me some seeds both of his Alice Roosevelt and his new type (after 1923 indicated as „Deken Vergeer”) together with some of the Westlandia type also cultivated by him.

All three forms proved to breed true in some hundreds of specimens each, belonging to four and five generations. After making sure of the constancy I made the crosses Deken Vergeer \times Alice Roosevelt and Deken Vergeer \times Westlandia, both reciprocally. In all four crossings the result was a uniform F_1 with no differences between the reciprocal matings, and an almost absolute dominance of the Alice Roosevelt and Westlandia type. In young plants the hybrids cannot possibly be discerned with certainty from the pure Alice Roosevelt and Westlandia. The leaflets of the full-grown leaves of hybrids however are sometimes

a trifle coarser. Yet there remain many specimens of which one cannot decide whether they will be homo- or heterozygous.

In the F_2 the Deken Vergeer leaf-type reappeared for one fourth of the total number of plants as well in the cross with Alice Roosevelt as in that by Westlandia. Out of 1102 F_2 plants from the Westlandia cross 816 had finely incised leaves and 286 the coarse type of the Deken Vergeer (expectation in case of a 3 : 1 ratio $826\frac{1}{2} : 275\frac{1}{2}$). For the 251 Alice Roosevelt F_2 hybrids the figures are 181 and 70 (theory $188\frac{1}{4} : 62\frac{3}{4}$). In both cases there is a small excess of the recessive type.

In F_3 the Deken Vergeer leaf-form bred true (118 specimens from 3 motherplants). Out of 5 F_2 plants of the Westlandia type 2 had a non-splitting progeny and 3 produced a segregating one in rather varying ratios, in totality however in a clean cut Mendelian one (123 : 42, expected $123\frac{3}{4} : 41\frac{1}{4}$).

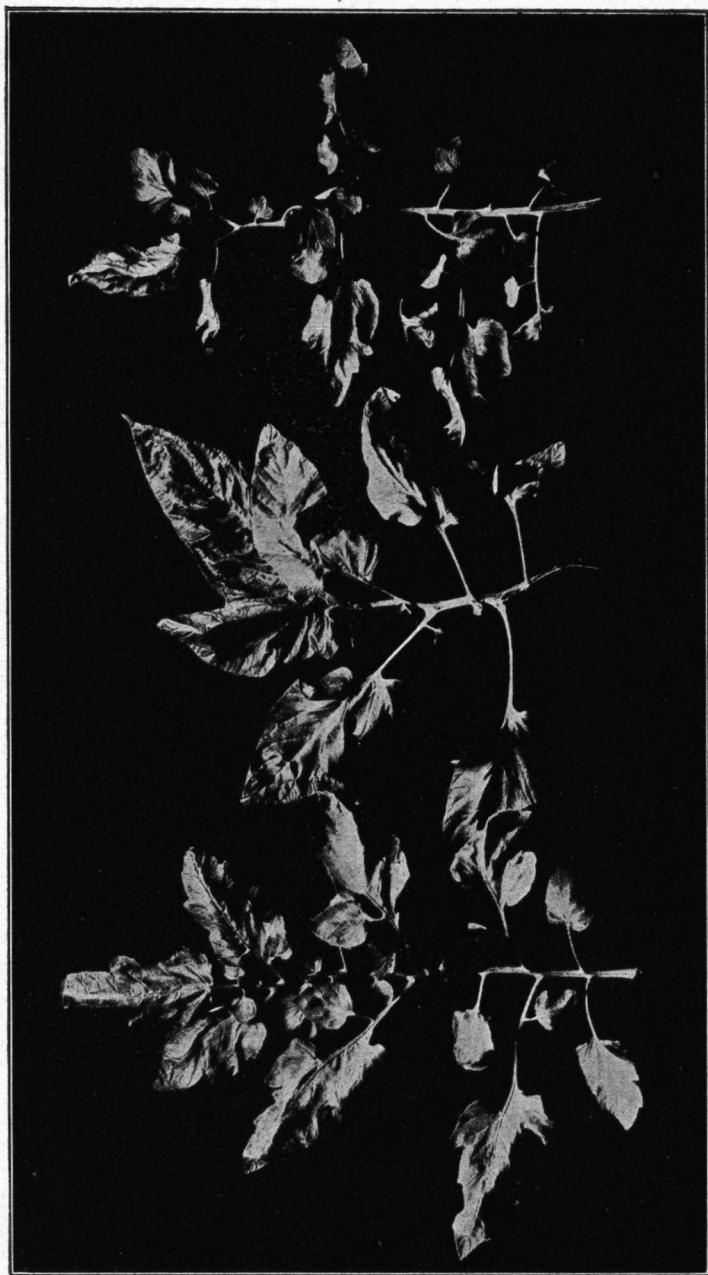
As to the fruits the Westlandia has medium sized bi- and trilocular spherical fruits; those of the Deken Vergeer are more flattened, plurilocular and somewhat ribbed, a transverse section often showing an oval with a crenate outline. The F_1 fruits resemble practically those of the Westlandia (there is only a slight indication of ribs), predominantly they are trilocular, sometimes however two- and four-celled. My numbers of studied F_2 and F_3 plants are too small to be significative. Only I cannot imagine that in this case the plurilocular type should be a simple recessive like Price and Drinkard¹⁾ found in their tomato crosses, nor that it should be double recessive as Crane reports of the „Wonder of Italy” as against „Listers prolific”. In one F_3 family of which 49 specimens have been

¹⁾ Price, H. L. and A. W. Drinkard. Inheritance in tomato hybrids. Virginia Agric. Exp. St. Bull. 177, 1908.

²⁾ Crane, M. B. Heredity of types of inflorescence and fruits in tomato. Journ. of Gen. V. 1915.

*Reciprocal crosses of Deken Vergeer with Alice Roosevelt
and Westlandia.*

Parents	Gen.	Number of plants	Leaves		Expectation
			fine	coarse	
Deken Vergeer × Alice Roosevelt	F ₁	131	131	—	188¼ : 62¾
Alice Roosevelt × Deken Vergeer	"	77	77	—	
	F ₁	208	208	—	
	F ₂	122	89	33	
	"	96	67	29	
	"	33	25	8	
	F ₂	251	181	70	
Deken Vergeer × Westlandia	F ₁	111	111	—	
Westlandia × Deken Vergeer	"	279	279	—	
	F ₁	390	390	—	
	F ₂	139	103	36	826½ : 275½
	"	257	191	66	
	"	368	281	87	
	"	167	122	45	
	"	171	119	52	
	F ₂	1102	816	286	
F ₂ plant of Westlandia type	F ₃	23	23	—	
	"	88	88	—	
	F ₃	111	111	—	
F ₃ plant of Westlandia type	F ₃	49	31	18	123¾ : 41¼
	"	103	84	19	
	"	13	8	5	
	F ₃	165	123	42	
F ₂ plant of Deken Vergeer type	F ₃	21	—	21	
	"	23	—	23	
	"	74	—	74	
	F ₃	118	—	118	



Leaves of Alice Roosevelt, Deken Vergeer and Westlandia.

planted out, all had bi- or trilocular fruits, also the 8 plants with Deken Vergeer leaf-type. This proves that the character of coarse leaves may be inherited separately from that of plurilocular fruits.

As the „Deken Vergeer” has originated as a single individual with a recessive leaf character from a type that had already been cultivated for some generations, and as it never reappeared again, and also cannot be explained as an accidental cross with the Westlandia, flowering in the neighbourhood, it has to be looked upon as arisen by mutation.
