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The Tomato Genetics Cooperative is a group of workers who have a common interest in tomato genetics and who are organized informally for the purpose of exchanging information and stocks. Participation is voluntary, and costs of activities are met by assessments to members.

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As of December 31, 1980, TGC membership stood at 354 (160 U.S. and 194 from other countries), and the financial balance was $1,359.64.

This issue contains the usual sections except bibliographies. Preparing bibliographies has become an increasingly expensive and difficult task. The accelerating proliferation of titles, often of inconsequential nature, from certain regions aggravates the problem of selecting meaningful literature on tomato genetics. This problem has been discussed at several annual meetings and the majority opinion, formulated on a discussion of these issues, favored discontinuation.

The annual meeting was held in conjunction with the Tomato Breeders Round Table in Culiacan. Minutes appear below.

Once again Dora Hunt has shouldered the many tasks essential for the production of this TGC Report. Memberships, financial accounts, cracking the whip to assemble all contributions on schedule, and the countless other jobs required in the managing and editing of the Report has been her responsibility. Kathy Hykonen typed the master copies and Maureen Farrell aided in proof reading. To them and many other dedicated assistants who helped with TGC 31 we express our deep appreciation.

Coordinating Committee

S. Honma
E. A. Kerr
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ANNUAL MEETING

The annual meeting of the Tomato Genetics Cooperative was held in conjunction with the Tomato Breeders Round Table in Hotel Executivo, Culiacan, Sinaloa, Mexico, February 22, 1980. The meeting was attended by some 50 tomato workers, mostly TGC members. C. M. Rick, who presided, reported a balance of $1,391.08 and a membership of 341 as of December 31, 1979, representing an increase in each category.

George Reynard has retired after many years of active service, and, at his request, he has been replaced on the Coordinating Committee. As a representative of industry, Al Stevens, now with the Campbell Institute for Agricultural Research, has been appointed to replace George.

Rick reported that TGC 30 will contain a revised linkage summary, an updated list of tomato species stocks maintained by the Tomato Genetics Stock Center, and a 10-year index, which is being faithfully compiled by Dora Hunt.

Following the favorable consensus of the 1979 annual TGC meeting, the TGC is reprinting reports No. 1-10 as a unit.

Rick announced his intention to retire as Chairman of the Coordinating Committee. This announcement prompted a resounding ovation in recognition of his 31 years of service in this capacity ever since the TGC was founded.

R. W. Robinson
Secretary pro tem.

PART I

RESEARCH NOTES

Avdeyev, Y. I. Pleitropic effect of *y* gene.

Crack-resistant forms were not found amongst more than 20 varieties with the y gene (colorless fruit epidermis; pink fruit color). All y segregants in the F_2 and F_3 generations of crosses between pink-fruited varieties and crack-resistant red-fruited lines were also susceptible. Presumably y has a pleiotropic effect on susceptibility to cracking. This conclusion is confirmed by experiments with spontaneous mutants, selected for 10 years from vars. VF-145-F5, Epoch, and Niskorosly Shtambovy. In contrast to the high crack resistance of these varieties, their respective *y* mutants were crack-susceptible and had less mechanical firmness--a condition that might be connected with diminished synthesis of pectins. The following table shows data that characterize one of these mutants.

Forms of Niskorosly Shtambovy	Total yield kg/m^2	Early yield kg/m^2	Fruit weight g	Piercing strength g/mm^2	Crushing strength of fruit kg	Plants with cracked fruits %	Cracked fruits per plant %
+/+	4.09±0.76	0.63±0.18	55.8±8.5	257±6.7	4.43±0.27	0	0
y/y	6.07±0.63	0.40±0.09	63.1±6.0	178±4.8	4.01±0.28	100	18.6±1.23

Farrell, M. A homozygous-viable lanceolate-leaf mutant.

Two phenotypically distinguishable classes of lanceolate-leaf mutants were observed in the progeny of 78L 1101-308, a 90% sterile M_1 (EMS) plant of 25% normal (cv. VFNT Cherry) diameter. One has extremely narrow leaves with an abundance of axillary shoots ("La-like/La-like"), while the other has elongated leaves and is intermediate in axillary shoot number and flower size ("La-like/+"). A stunted yellow-virescent mutant with tiny leaves and a congested branch habit (stemming from foreshortened internodes) assorted independently of the La-like progeny of this plant, as seen in the class distributions--104 L/L, + 255 L/+, + : 130 +/+, + : 32 L/L, mutant : 85 L/+, mutant 52 +/+, mutant (contingency chi-square = 0.29).

A 29.30 contingency chi-square value for the F_2 : La-like x not (LA 1164) segregation suggests linkage with this chromosome 7 marker. (Linkage is also suggested by the contingency chi-square value of 5.49 for the La-like x var segregation.) The product method predicts an La-like--not linkage of 11.6 + 4.3 cM, emphasizing the requirement for

generating larger progenies in order to verify the true locus position (see Table). La (LA 335, chromosome 7L-48) is currently shown to map 8 cM distal to not. Thus, although it seems likely that this mutant is an allele of La, non-complementation may be confirmed only by making crosses with the new homozygotes and scoring large separate F_1 progenies. The general problem of allele tests between dominant mutants that are homozygous lethal was considered by Rick and Bosland (TGC 28:17).

Homozygous La-like segregates of the M_1 plant, while viable plants, have yet to set fruit, but homozygous F_2 segregates from the above mentioned cross to LA 1164 have very small flowers and set elongated, beaked fruits (see illustration). Four elongated, triangular seeds produced in these fruits gave rise to plants with the homozygous La-like phenotype.

This variant constitutes the third La-type mutant in our collection. The original La mutant arose spontaneously in a hairy cherry background (LA 335), and a narrow-leaf mutant derived from Hildering's EMS survey with the cv. Moneymaker (3305); in both, the 'La/La' genotype is lethal. Mathan (TGC 6:19) obtained subvital La/La segregates by backcrossing La/+ F_1 plants, produced by hybridization of heterozygotes with normal plants, to La/+ mutants. These homozygotes did not bear seeds. This led Mathan to postulate a contribution of one or more modifiers by the normal stock. Modifiers might likewise contribute to seed production in this mutant.

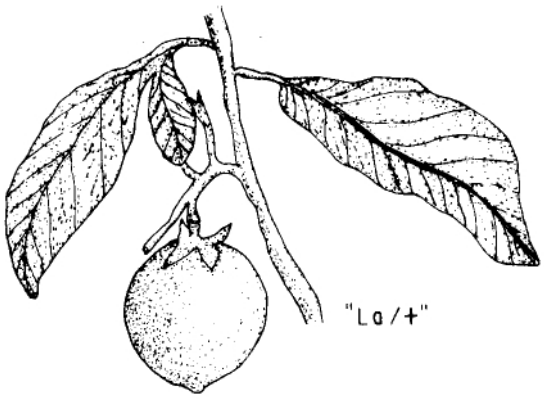


Table. F_2: La-like/+ x var--not

		L/L	L/+	+/+
+	+	42	72	3
+	not	13	32	0
var	+	0	24	3
var	not	40	3	0

Farrell, M. Phenylalanine ammonia lyase activity in anthocyaninless mutants.

Phenylalanine ammonia lyase (PAL) (E.C. 4.3.1.5), a bridging (regulatory) enzyme discovered by Koukol and Conn in 1961, catalyzes the deamination of phenylalanine to yield trans-cinnamic acid, a precursor for anthocyanin pigments as well as other phenylpropanoids. Five different anthocyaninless mutants and the isogenic anthocyanin-plus lines in which they arose--are and aw in cv. V36 (La 490); C545 (ah), E128 (ah), and G146 in cv. VFNTCh (LA 1221); and of in cv. Cal Red Cherry (LA 337)--have been assayed for the activity of the PAL enzyme. Seeds were germinated in blotter-lined sandwich boxes maintained under a uniform temperature (25° C) and light (12 hr) regime, and supernatant extracts of seedlings were assayed at 8 to 17 days. Older material did not provide a sufficiently clear solution, and shoot material, in addition to being more cloudy, reacted with the substrate at lower rates than did the root material (Fig. 1). Five additional assays of ah roots showed a reduction in enzymic activity when compared to the isogenic anthocyanin-plus roots raised in the same incubator for the

same length of time and using the same experimental protocol (Fig. 2). The complete experimental protocol, initiated by Dr. S. Yang, will be described in a subsequent publication. Experiments are currently underway to establish the respective Km's of the mutant and normal enzymic extracts.

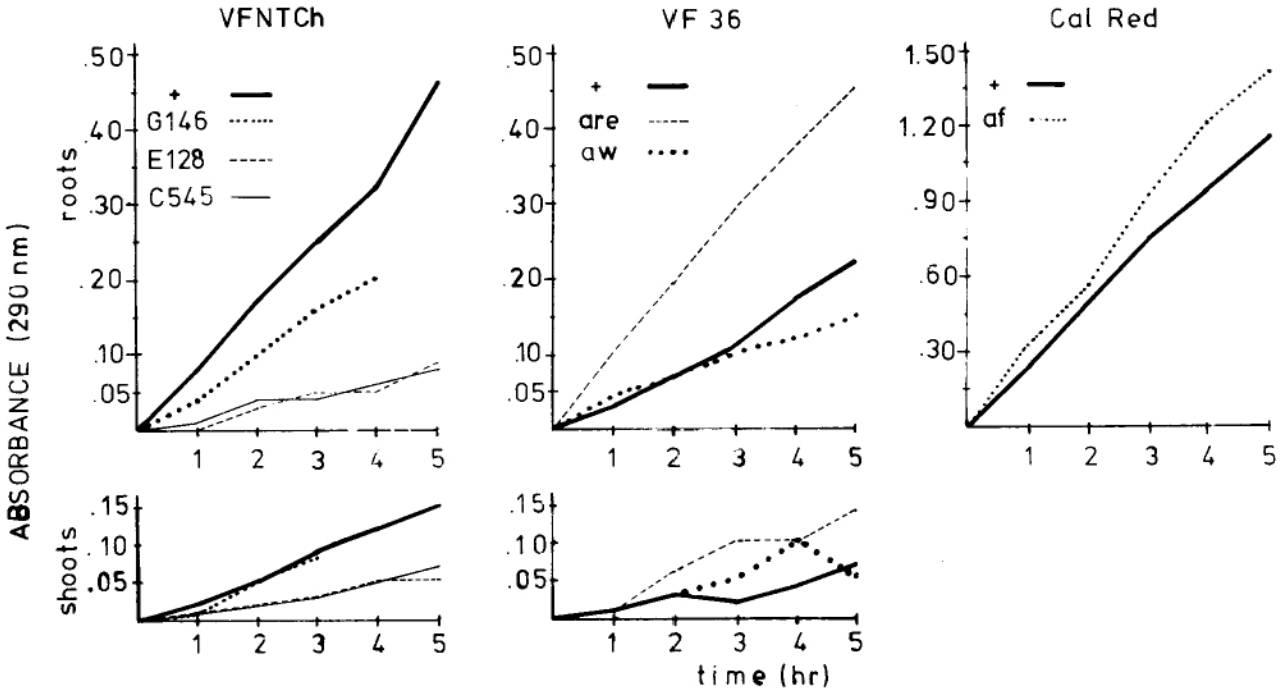


FIGURE 1. PAL activity in mutant seedling roots and shoots compared to their respective isogenic lines. Activity is seen by the absorbance of the PAL reaction product, trans-cinnamic acid. ("C545" and "E128" are ah alleles.)

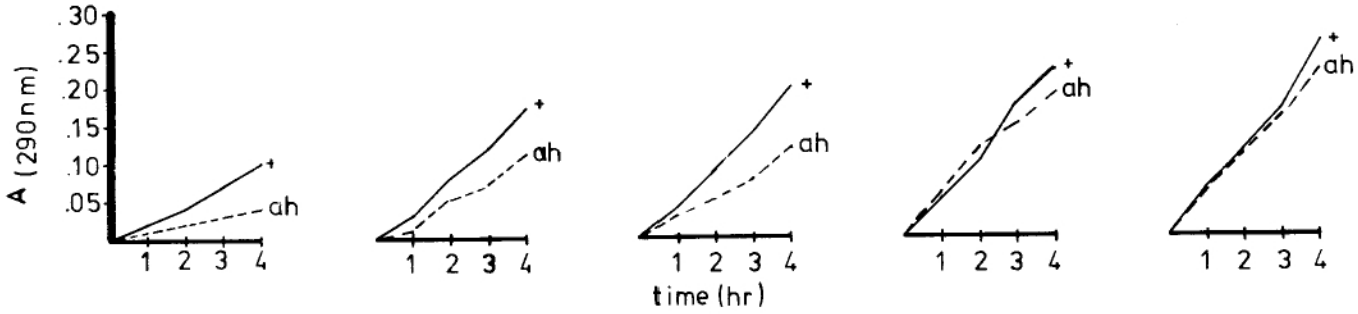


FIGURE 2. PAL activity in roots of the ah mutant and it's isogenic cultivar (+). The five experimental protocols differed in substrate concentrations; present experiments are directed at obtaining Km values of the PAL enzyme in the mutant and mutant-free systems. Paired mutant and normal seedlings were grown under identical photo-periodic, temperature, and moisture conditions and were assayed on the same day.

Mutant scions grafted onto normal rootstocks do not suggest that the precursors of the anthocyanin pigment are translocated in the xylem, and reciprocal grafts have not revealed inhibitor action of a translocatable nature. Progeny derived from fruits borne on the grafted anthocyaninless sh.iots lacked anthocyanin. Addition of varying concentrations of trans-cinnamate to germinating seeds (by soaking the blotter), to shoot tissues (by spray treatments), and to cuttings (via the rooting solution) have thus far not resulted in pigment synthesis.

The two ah mutants used in this experiment (C545 and E128) were discovered by Farrell and Rick in a 1979 field EMS survey of cv. VFNTCh, and allelism with the chromosome 9 ah marker (chr 9L-24) has now been confirmed. Transcriptional differences induced by the EMS modification of the DNA template could lead to a configuration change in a protein such as the PAL enzyme. Biochemical investigations indicate that the PAL enzyme in potato cultivars is a tetramer. A failure of the altered pacemaker enzyme to effectively recognize and bind the substrate could be reflected in a reduction in enzymic efficiency and could result in the kinetically favored channeling of the trans-cinnamate product to the coumarin (ortho hydroxylase), lignification (reductase), or conjugate (transferase) phenylpropanoid pathways at the expense of the flavonoid (synthase) pathway which mediates anthocyanin synthesis.

Holle, Miguel and C.M. Rick The "hygienic" method of collecting revisited.

In August-October, 1980 we had the opportunity to reevaluate the use of TP for collecting and storing fruits and other plant parts while we were collecting tomato species in Ecuador and Peru. In general our observations supported the contentions stated by us in TGC 29:24-25, particularly those relating to the Holle, Rick, and Fobes' Inverse Quality Rule (utility for plant collecting purposes is inversely related to customer appeal). We were very pleased to report that the TP supply situation in both countries has not deteriorated; brands ideal for our purposes were still available and in good supply.

Our travels afforded an unusually good opportunity to test a large assortment of brands; furthermore, besides rolls that we purchased in tiendas and supermercados, additional categories for evaluation were on display in the bathrooms of our lodging places. We nevertheless regret to report that certain brands are not being produced with satisfactory quality control. We discovered, for example, that the paper might not be continuous, but come to abrupt breaks within the roll; also that the paper thickness might vary, even to the extent of developing large holes marginally or metacentricly. We also found that an additional brand was characterized by large transverse incisions that extended partway into the sheet from the margin. Needless to say, all of these defects are highly disconcerting, whatever the intended purpose of the product.

Another difficulty inherent in the application of this technique is that it can become so engrossing that the collector might become sufficiently intrigued by the fascination of collecting different brands and colors that he is distracted from the primary objective of the project. We found ourselves continually struggling to resist this temptation. Even so, we accumulated an inventory that would have been adequate for tomato collecting beyond our wildest dreams.

The virtues of the hygienic method continued to be manifest throughout our expedition. As many as 50 different items could be collected and bound together in a single unit, which can be conveniently placed in a small paper bag and properly labelled. Fruits harvested in immature stages were held as long as 5-6 weeks in good condition until they ripened in transit to afford mature seeds.

Howes, Paul B. Stem brittleness in homozygous hl plants caused by storied xylem.

Plants homozygous for hl (hairless) also have a brittle stem (Butler, J. Hered. 43:32). Microscopical examination of tangential sections of both normal and brittle stems reveals that the former has essentially non-storied wood while the latter has a distinctly storied arrangement of xylem cells. It is reasonable to assume that the storied xylem in homozygous hl plants is the direct cause of stem brittleness. An underlying relationship between the lack of trichomes and storied xylem, pleiotropic effects of the hl gene, has yet to be elucidated.

Kerr,E. A. Linkage relations of imb-irr-y on chromosome 1.

Irregularis (irr) was assigned to chromosome 1 on the basis of small F_2 populations showing linkage between it and y (Kerr TGC 14:16). Soost (TGC 18:4) grew F_2 populations segregating for irr but did not report any data. Linkage relations of imbecilla (imb) have been reported by Rick and Boynton (TGC 13:40-42) and Philouze (TGC 23:28-29) who placed it 23 and 34 units respectively from y. Zobel (TGC 22:30) placed imb 79 units from y but apparently did not study imb specifically. Presumably because of these discrepancies, imb is not given a location on the latest map (TGC 30:3). Kanwar, Kerr and Harney (TGC 30:20-21) reported that imb was about 17 units from Cf-1 and Cf-4 which have been assigned positions 62 and 64 units respectively from y.

My 1980 results with imb-y were not consistent (Table 1) since one population in coupling gave 31% crossovers and the other 50%. Previous studies with populations in

Table 1. Data from two point F_2 tests of y, irr and imb.

Gene pair	Phase	Line	AB	Ab	aB	ab	χ^2L	C.O.
y-irr	Repulsion	60-979	54	18	34	4	4.40*	36
y-irr	Coupling	62-989	56	2	5	10	23.78**	11
	Coupling	66-1153	41	5	3	7	12.70**	17
	Coupling	66-1154	40	2	9	8	11.75**	17
	Coupling	80-4007	102	5	12	7	11.46**	21
	Coupling	80-4026	75	16	16	8	2.51	38
			314	30	45	40	52.21**	23
y-imb	Repulsion	65-1249	89	29	40	4	4.61*	34
	Repulsion	66-1153	27	19	7	3	1.14	43
			116	48	47	7	5.73*	36
y-imb	Coupling	80-4007	94	13	12	7	5.93*	31
	Coupling	80-4026	72	19	19	5	0.01	50
			166	32	31	12	3.33	40
irr-imb	Repulsion	66-1153	23	22	12	1	9.39**	20
irr-imb	Coupling	80-4007	102	13	7	7	9.50**	25
		80-4011	105	11	8	9	13.47**	22
		80-4026	84	8	9	18	35.50**	17
			291	32	24	34	53.67**	20

χ^2L - p .05 = 3.841, p .01 = 6.635

repulsion gave 36% crossovers. The imb-irr distance was 20 units in one test in repulsion and averaged 20 units in three tests in coupling. The irr-y distance was 36 units for one repulsion and 23 units for five coupling tests. This suggests that the order is y-irr-imb. This was confirmed by two F_2 populations having the three genes in coupling (Table 2). From our work the order and location of the genes is

approximately y 30 irr 55 imb 75 Cf 92. This places imb very close to scf.

Table 2. Three point linkage test of y-irr-imb in F_2 coupling.

	Population 80-4007	Population 80-4026	Totals	
Parental types				
+ + +	92	67	159	
y irr imb	4	5	9	168
Single crossover				
+ irr imb	3	11	14	
y + +	9	16	25	39
Single crossover				
+ + imb	10	8	18	
y irr +	3	3	6	24
Double crossover				
+ irr +	2	5	7	
y + imb	3	0	3	10

Kerr,E. A. Linkage studies of green ripe and never ripe.

Green ripe arose as a chimeral fruit (Kerr, TGC 8:22). This would suggest that the mutant was dominant but in greenhouse trials the green color of the heterozygous fruits disappeared. Accordingly the gene was considered to be recessive and was designated gr. However, tests on the inheritance of this gene were inconclusive.

Never ripe (Rick, TGC 6:22-23) also appeared as a chimeral fruit and appeared superficially to be a complete dominant. It was designated Nr. It has been assigned to chromosome 9 (Kerr, TGC 19:12).

Under field conditions, I have not been able to distinguish these genes reliably. Both have delayed production of red color, the heterozygous fruits are intermediate in color and can be identified under most conditions. I have found both easier to score as dominant genes and have used the symbol Gr for green ripe in my tests.

In 1980, an F_2 was produced between homozygous Nr and homozygous Gr. Of the 110 plants that produced ripe fruit, 10 were normal red, only 3 were scored as heterozygous mutant and 97 were either Nr or Gr. This population was segregating for some genes with low viability and 33 plants died before maturity. Consequently, no conclusions on possible linkage could be drawn. However, these genes are definitely not alleles.

It is proposed that the symbol for green ripe be changed from gr to Gr.

Kerr,E. A. Yellow green-2 (yg-2) and auroid (aud) are alleles.

In 1958, Burdick (TGC 8:10) reported a yellow green mutation, yg-282, obtained by thermal irradiation from L. pimpinellifolium. The designation of this mutant was later changed by the Gene List Committee to yg-2 (TGC 10:3). In 1968, Rick, Reeves and Zobel (TGC 18:34-35) reported in a breeding line a spontaneous bright yellow mutant designated auroid (aud). This mutant showed linkage with alb and fd on chromosome 12. Kerr (TGC 29:26-28) presented data indicating linkage of yg-2 with alb and that yg-2 and aud were approximately the same distance from hp.

The mutants aud and yg-2 could not be differentiated with certainty in our trials. In such a case there is always the remote possibility that someone has goofed. Accordingly, seed of aud was obtained from Rick and yg-2 from Robinson. All combinations of aud (Rick), yg-2 (Robinson) and yg-2 (Kerr) were produced, and F_1's grown. In each case, the F 's were indistinguishable from each other and from the parents. The original descriptions of yg-2 and aud indicate that the hypocotyl of yg-2 is elongated but that of aud is normal. This difference was not always evident under our conditions. Since the name and symbol yellow green-2 (yg-2) has precedence, the designation of aud should be changed to $yg\text{-}2^{r}$ to indicate their allelism and the discovery of aud by Rick.

Kesicki, E. Enigmas of species crossing in Lycopersicon.

Nearly all published papers concerning hybrids between red- and green-fruited tomato species contain information that such hybrids are self-incompatible and have small yellow or orange fruits. Thus, I was surprised that some plants I obtained after crossing L. esculentum cv. Potentate with L. peruvianum PI 126435 had rather large and red fruits (TGC 29). The plants resembled L. esculentum in other characters also, but differed distinctly from the mother variety Potentate. Some plants with red fruits had bracts, pseudostipules or long hair on the fruits which suggested they were hybrids. Segregation of fruit color in F_2 indicated the same.

The red-fruited F_1 plants were then crossed to L. peruvianum. Eleven tested BC_1 plants were intermediate in many characters but five of them had red fruits, five others, orange and one, pink.

A similar case--plants of L. esculentum type having some wild species characters after crossing L. esculentum with L. peruvianum--was described by Georgieva (Rod Lycopersicon, Sofia 1976, p. 137). She gave, however, no information about further generations.

New facts in the problem were provided by crosses between L. esculentum and F_1 hybrid L. peruvianum X. L. hirsutum which I studied last year. The plants were L. esculentum type and set fruit very well. Most of them had red fruits, only a few were yellow or green (Table 1), and these were rather large. The plants also had some wild species characters: pseudostipules, bracts at the base of peduncles and pedicels, dark green stripes and long hair on fruits, big branched inflorescences (Table 1) and very often large flowers similar to flowers of the incompatible species, clearly indicating they were hybrids. It should be pointed out that wild species characters were not correlated. A single plant would have only one such feature, bracts for example, or several, such as pseudostipules, branched inflorescences and hairy fruits.

Table 1. Frequency of some characters in the first generation of hybrid *L. esculentum* X F_1 (*L. peruvianum* X. *L. hirsutum*) and their parents (%).

Character		*L. esc* X (*L. per.* X *L. hirs.*)	*L. per.*X *L. hirs.*	*L. esc.*	*L. per.*	*L. hirs.*
pseudostipules		24.4	100	0	100	100
bracts on the base of peduncles		26.2	100	0	100	100
bracts on the base of pedicels		21.6	100	0	100	100
big, branched inflorescences		58.0	100	0	100	100
dark green stripes on fruits		39.4	100	0	100	100
long hairs on fruits		59.9	100	0	0	100
fruit color	red	88.9	0	100	0	0
	orange	9.4	0	0	0	0
	yellow	0.9	0	0	0	0
	green	0.7	100	0	100	100
fruit diameter	> 5 cm	15.1	0	100	0	0
	3-5 cm	63.0	0	0	0	0
	< 3cm	21.9	100	0	100	100
number of tested plants		965	3	30	30	30

The hybrids L. pimpinellifolium X F_1 (L. peruvianum X L. hirsutum) also studied last year, gave similar results, only fruits were small.

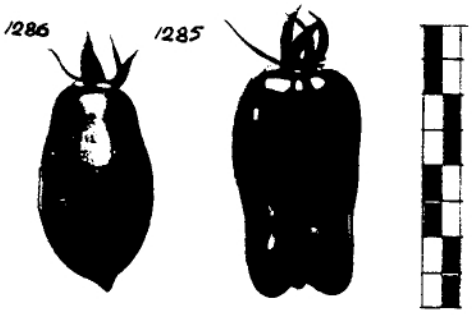
A few years ago, I had three hybrids of L. peruvianum X L. esculentum made via periclinal chimera L. peruvianum + L. esculentum. Those plants also very much resembled the L. esculentum parent, and it was very difficult to ascertain that they were really hybrids. It seems therefore that dominance of L. esculentum characters probably did not depend on the direction of crossing.

It is important to note that all such observations concerned hybrids with participation of the L. pervuianum genotype. I did not notice similar phenomena after crossing L. esculentum with L. hirsutum.

It is yet too early to discuss reasons for the described phenomena; this intriguing problem needs further research.

Lukyanenko, A. N. and M. E. Egioyan A new tomato mutant.

A new spontaneous mutant has been found in the local line at Krimsk Plant Breeding Station of All-Union Institute of Plant Industry. Its phenotypical manifestation is the following: mutant plants have a tall indeterminate bush, a prolonged form of fruit (index 1.5-1.6) with a modified tip. At the tip of the fruit there is a hollow 5-10 mm deep from which an epiglottis extends. The form of



the tip resembles a flower of the snapdragon (Antirrhinum), hence the gene determining this trait is indicated by us with the anr symbol. The analysis of a number of crosses with the mutant showed this trait to be a recessive character. The gene is linked with sp^+, hence it is probably on chromosome 6.

Pleiotropic action of the gene is a very weak joint of the fruit stem and a hollow fruit. The mutant is easily identified under field and greenhouse conditions.

Martin, B. A. Experiments on the phosphate deficiency syndrome mutant (pds). (Submitted by C. M. Rick)

Tomato plants homozygous for the recessive phosphate deficiency syndrome allele (pds) exhibited what appeared to be severe phosphate deficiency symptoms, i.e. small stature, purple coloration, and chlorosis of older leaves when grown on supraoptimal concentrations of inorganic phosphate (Pi) (Rick, Zobel, Opeña 1970, TGC 20:52-54). In addition, when pds/pds scions were grafted onto wild type root-stocks, the plants appeared phosphate deficient. When the reciprocal graft was made, wild type scion onto pds/pds root-stock, the plants grew normally (C. Rick and J. Fobes, personal communication). This evidence suggested that pds/pds shoots were unable to produce a metabolite necessary for normal growth. The roots were either able to produce the metabolite or it was imported from normal leaves.

Experiments were designed to determine whether the pds mutation was expressed in callus made from homozygous pds plants and to determine whether the pds allele is a lesion in either P-choline transport or metabolism since P-choline is the primary form of organic phosphate transported in the xylem sap of tomatoes. Further grafting

experiments and experiments with whole plants were performed to confirm previous reports and to attempt to achieve phenotypic reversion of the pds phenotype.

Tomato var's VF-36, VF-145, and var. VF-36 with pds/pds as well as the L. pimpinellifolium seeds used in these experiments were obtained from Dr. C. M. Rick, University of California, Davis, through Dr. John Fobes. Seeds were germinated by placing them on basic MS medium (Murashige and Skoog, 1962 Physiol. Plant. 15:473-479). The plants were allowed to grow for 10 days on this medium. Hypocotyls were excised and placed, 4 per plate, onto MS medium supplemented with 8.9µM benzyl-adenine and 10.8µM napthaleneacetic acid in 100 x 15 mm plastic petri plates (33 ml volume). Callus was grown for 30 days in the light with a 16 hour day, at 70 E sec^{-1} m^{-2} , at 25° C. Rapidly growing callus was removed from the outside edge of the developing mass and subcultured onto fresh medium. After another 30 days of growth, pieces were taken from these calli for the experiments. The growth of callus was monitored during these experiments by individually weighing each of the 4 pieces of callus which were used in each replicate plate, then weighing each of them at the end of the experiment. All of the experiments were done with 10 replicate plates per treatment unless otherwise noted. The plates were sealed with parafilm to prevent dessication for the duration of the experiments, which was typically 30 days.

Whole plants of VF-36 and homozygous pds/pds were grown heterotrophically by placing germinated seeds into 2-liter glass jars which contained in a 100 ml volume Hoagland's salts, 88 mM sucrose and 0.9% Difco bacto agar. The jars were covered with petri plates, sealed with parafilm and placed in a growth chamber which had a 16 hour day, 100µE $sec^{-1}m^{-2}$, at 30°C day and 25°C night temperature.

The grafting experiments were performed on plants grown in the greenhouse at 30° C day and 25 C night temperatures in the summer. The pds/pds genotypes used as scions were 15-20 days old.

The growth of pds/pds callus was compared to that of VF-36 callus by growing the strains on 10^{-6} to 10^{-3} M Pi (Table 1). Both had the same response to the concentration of Pi in the medium. This experiment indicated that the pds/pds mutant phenotype was probably not expressed in cultured cells obtained from the hypocotyls of this mutant.

Since the mutation was expressed in the shoots of whole plants, the effect of P-choline, the primary form of organic phosphorus transported in tomato plants (Tolbert, N. E., and H. Wiebe 1955 Plant Physiol. 31:407-408), was tested. There was no significant effect of P-choline treatment on induction or growth of either VF-36 or pds/pds callus (Table 2). The only significant effect was an inhibition by P-choline of callus growth from L. pimpinellifolium hypocotyls.

pds/pds shoots grafted onto VF-145 root stocks had the same growth rate and appearance as pds/pds plants. The reciprocal graft of VF-145 shoots onto pds/pds scions grew normally. These experiments confirmed the observations of Rick et al. However, when pds/pds shoots were grafted onto the apical shoots of 70 day old VF-145 plants, the pds/pds shoots grew normally for about 40 days, after which they started turning yellow. (This grafting method was used to generate pds/pds seed.)

The effect of high nutrient nitrogen on growth of pds/pds plants, grown on a 30% sucrose medium in the light, was tested to determine how the growth of the pds/pds mutant would compare to that of VF-36 when photosynthesis was not a limiting factor (Table 3). This experiment was performed at 2 levels of nitrogen, the normal level of 16 mM NO_3^- and 1 mM $NH4^+$ in Hoagland's nutrient and a high level of 20 mM NO_3^- and 20 mM NH_4^+. The pds/pds plants in the high nitrogen medium grew 3-4 times larger than those grown in normal Hoagland's nutrient. The VF-36 plants exhibited the opposite response, they grew twice as well in the Hoagland's solution as in the high nitrogen medium. While it was clear that the high nitrogen treatment did not reverse the

mutation, this medium stimulated growth of the mutant. The significance of this observation may be that the pds/pds mutants are not defective in phosphorus metabolism. pds may be a lesion in the metabolism of nitrate which mimics the phosphate deficiency syndrome.

Table 1. The effect of Pi concentration on the growth of VF-36 and pds/pds callus.

The callus was initiated and grown as described in the methods section. The initial inoculum was 4 pieces of callus per plate, each weighing approximately 400 mg. The callus was allowed to grow for 30 d in the light.

Treatment (Pi)	Callus growth (g)	
	pds/pds	VF-36
10^{-3} M Pi	4.86	5.28
10^{-4} M Pi	1.30	0.94
10^{-5} M Pi	1.06	0.73
10^{-6} M Pi	0.88	0.60

$S_{\bar{D}} = 0.367$

Table 2. The effect of P-choline on callus induction and growth.

The VF-36, pds/pds and L. pimpinellifolium seeds were germinated and the seedlings were grown on MS medium. The hypocotyls were excised after 10 d of growth and four 1 cm segments, each obtained from 1 seedling, were placed on the various media. The callus was weighed after 30 d.

Treatment	$\bar{X}$ Callus wt (g)		
	L. pimpinellifolium	VF-36	pds/pds
Control	79.9	20.6	21.0
10^{-6} M P-choline	69.6	16.6	28.2
10^{-5} M P-choline	66.9	17.4	33.1
10^{-4} M P-choline	51.9**	21.1	17.1
10^{-3} M P-choline	55.4*	12.6	19.8

*LSD .05 = 18.75, ** LSD .01 = 24.64, $S_{\bar{D}} = 9.6$

Table 3. The growth of pds/pds and VF-36 plants grown on normal and high nitrogen medium.

Germinated seeds were placed in 2 quart jars containing Hoagland's nutrient, 88 mM sucrose and 0.9% Difco bacto agar. The jars were placed in a growth chamber and the plants were allowed to grow for 60 days. The values represent the mean weight of the plants in 4 jars. There were 4 plants per jar.

	Total fresh weight (g)		Total dry weight (g)	
Variety	16 mM NO_3^-	40 mN NO_3^- + 20 mN NH_4^+	16 mM NO_3^-	40 mM NO_3^- + 20 mM NH_4^+
pds/pds	16.3 ± 3	53.4 ± 4	1.8 ± 0.4	5.8 ± 1.1
VF-36	213.0 ± 54	120.0 ± 58	19.4 ± 8.0	11.7 ± 4.0

Persiel, Friedegunde and R. Reimman-Philipp Necrosis in tomato produced by the factor for resistance to Cladosporium fulvum (Cf-2) and its suppression by Ne.

There is some contradiction in the early publications on resistance to Cladosporium fulvum in tomato based according to Langford (Can. J. Res. 15, Sec C., 108-128, 1937) upon a dominant factor for immunity (Cfp-1)(later Cf-2) and in addition to it upon an independently segregating dominant factor for resistance Ne. The latter is told to produce severe necrosis in the resistant plants, but to be expressed only in the absence of the factor for immunity. Therefore, in F_2 from a cross "susceptible x immune" a segregation of

12/16 double dominant = immune : 3/16 dominant only for the factor for resistance = necrotic : 1/16 double recessive = non-necrotic susceptible

would be expected.

In 1948, Langford (Can. J. Res. 26, Sec. C., 35-64) gave another explanation for the cooperation of the two factors involved in these days in resistance to Cladosporium fulvum. Now, the immunity factor Cfp-1 (later Cf-2) was not expected to work independently and epistatically to the factor for resistance Ne, but only together with it in the sense that it suppressed the necrosis produced by the latter. So, in F_2 a segregation of

9/16 double dominant = immune : 3/16 dominant only for the factor for resistance = necrotic 4/16 dominant only for the immunity factor or double recessive = susceptible, non-necrotic

would be expected and was shown not only by Langford himself but independently also by Quadt in 1953 (Der Züchter 23, 223-243). While Cf-2 (formerly Cfp-1) is located on chromosome 6 L, the necrosis factor is mapped as ne (dominant allelomorph suppressing the necrosis produced by Cf-2) on chromosome 2 (see TGC 30), although Langford himself in 1948 had mapped Ne on what he believed to be "chromosome I", but what obviously corresponds to chromosome 2 of today. Lyall (TGC 12) found in F_2 from 3 crosses with "Atom" a segregation of 13/16 normal:3/16 necrotic, and suggested

like Langford (1948) the genotype Cf-2Cf-2nene (corresponding to Quadt 1953 = NNhh) for the 3/16 necrotic individuals assuming that ne must be carried by most varieties of Lycopersicon esculentum and Cf-2 by "Atom". His explanation "the expression of ne requires the presence of Cf-2" is to some extent contradicting because one would not follow from it that necrosis is really produced by Cf-2 and suppressed by Ne. Unfortunately, so far as we know nobody has taken notice of ne; however, it appears to be a rather interesting gene, for instance, from the practical point of view because of the suppression of necrosis produced by resistance factors, or theoretically because of analytical chances for investigating the "necrosis suppressing principle". Are there possibly similar factors in close linkage of those immunity genes which are well known for effecting resistance without necrosis, and possibly without production of deleterious "phytoalexins"?

In order to get an approach to the answer we selected individuals with differing necrotic expression from a cross "Haubner's Vollendung" x "Atom" and examined the offspring from selfing in the field for necrosis. Having also examined the reaction to Cladosporium fulvum race "0" on cuttings of the same plants in the greenhouse, we identified

- homozygotes for immunity which showed no or only very small sparsely visible necrotic spots;
- homozygotes for resistance, showing severe necrosis;
- different types of non-resistant, non-necrotic homo- and heterozygotes.

Unfortunately besides race "0" we had available for testing the resistance factor only races "2.3" and "1.4" which were kindly provided by Mr. Hubbeling, Wageningen, Netherlands. As the immune selections were resistant to races "0" and "1.4" (without showing necrosis) but susceptible to "2.3", they do represent Cf-2Cf-2NeNe (according to Langford 1948) or NNHH (according to Quadt 1953).

In order to separate cf-1cf-2NeNe homozygotes (= nnHH according to Quadt 1953) from the other susceptible segregates, 38 testcrosses were made between susceptible and Cf-2Cf-2nene (= NNhh) plants, which were resistant but necrotic. Five of them were uniform for resistance to Cladosporium fulvum after artificial infection with race "0", so representing the cf-2cf-2NeNe homozygotes. These were crossed to varieties known as carriers of Cf-1 as "Leafmold Resister" and "Stirling Castle", and to "V 121" which carries Cf-3. After infections with races "0" and also "2.3" (in the case of the first mentioned cross) the F_1 generations were found to show resistance but medium necrosis. So, it could be stated that Ne did not suppress necrosis produced by Cf-1 or Cf-3. As it might be interesting for other researchers to include Cf-2Cf-2nene or cf-2cf-2NeNe in their experiments on observing different factors for resistance or different pathotypes of Cladosporium fulvum, we would like to inform them that we have these genotypes available for distribution.

Petrescu, Corneliu and Wu Ding Hua Breeding and testing for low temperature adaptation.

The shortage of energy to produce seedlings and early tomatoes obliges farmers to use the hybrids and varieties most adapted for setting fruits at low temperatures.

Many reports agree that the pollen of most of the commercial varieties is susceptible to low night temperature. We have noted a different behavior of the greenhouse hybrids in low night temperature conditions.

We tried to check different testing methods in order to study the influence of low night temperature on pollen maturity using 42 F2 hybrids between resistant and susceptible varieties. We have used as a source of low temperature adaptation Sub Arctic Delighted crossed with greenhouse and field varieties. The hybrids ware grown in a plastic greenhouse in the spring and fall. The night temperature during the opening up of the first 3 inflorescences was 5-10oC.

We compared the rate of plant growth with the number of points given for the blossom and fruit set ability (N. Musat method). We have also analysed the pollen viability with acetocamine and germination in vitro (sucrose 15%). We have also tried to compare our results with seed germination in high osmotic pressure solution - KNO3, 1%. Some seeds of two lines germinated in 60 hours but most lines and hybrids were inhibited and germinated after 5-8 days.

We have found a significant relation between the rate of growth and the number of points accorded for blossom and good fruit-set ability for most of the hybrids.

The acetocarmine test was not significant, but the germination of the pollen in vitro was much more conclusive and related with the fruit setting at low tempera- tures.

The germination of seeds in 1% solution of KNO3 can be used as an efficient method of selection for cold set ability or generally for non-favorable conditions, though it is not strictly related with low temperature adaptation.

It seems to us that cold resistance is not absolutely related with low temperature fruit setting and may be under control of different groups of genes.

Rao, R. N. and Panuganti N. Rao

Pachytene chromosome pairing in a sesqui-diploid Lycopersicon esculentum (4n) x L. peruvianum var. glandulosum (2n).

Details on the frequency and distribution of partner exchanges for the various chromosome sets in the triploid hybrid L. esculentum cv. Marglobe (4n) x L. peruvianum var. glandulosum (2n) were studied in comparison with the observations of a similar nature in the autotetraploid L. esculentum var. Marglobe to assess whether the genetic dissimilarities between esculentum and var. glandulosum are in any way reflected in chromosome pairing in the sesquidiploid. Generally in triploids where only 3 chromosomes are present for each set, a greater number of partner exchanges at pachytene and consequently more of multivalents at diakinasis would be expected since the competition between chromo- somes to pair with each other would be lass due to numerical decrease of chromosomes when compared to the autotetraploid. But in this sesquidiploid the multivalent frequency per cell at diakinasis found to be 2.15 is not significantly higher than the 2.02 in the autotetraploid. Also, in the partner exchange frequency for chromosome 6, there is not much difference between the triploid hybrid and the autotetraploid. However, chromosome 2 in the triploid hybrid formed partner exchanges more frequently than in the autotetraploid. The short arm heterochromatin of chromosome 2 showed stickiness, which is less intense compared to that of the 4n. Such heterochromatic stickiness was not noticed in any of the pachytene trivalents formed by other chromosome sets unlike the autotetraploid where chromosomes 5 and 6 rarely showed heterochromatic fusion.

The frequencies of partner exchanges in the three chromosome regions (centric, heterochromatic and euchromatic) for the different chromosome sets also varied to some extent from those of the autotetraploid. Partner exchanges in short arm heterochromatic regions were very much less for all the chromosome sets. Similarly, exchanges in centric regions also were fewer compared to the autotetraploid. For some chromosomes like chromosomes 5 and 7, the frequency of exchanges in long arm euchromatin was found to be less compared to short arm euchromatin. A maximum of 2

exchanges per set was noticed. However, a vast majority of pachytene trivalents showed only one exchange of partners.

The reduction in homologies between chromosomes of the two species might be to some extent responsible for the lower multivalent formation at diakinesis which is a manifestation of fewer partner exchanges at pachytene. Since this is an inter-specific hybrid where one of the parents is an autotetraploid and the other a basic diploid of another species, the chromosomes of the latter species may not be completely homologous to those of the former. Thus, because of the incomplete homologies, at least for some of the chromosomes, in certain segments, some inhibition for formation of partner exchanges in these segments might have occurred resulting in a reduced frequency of exchanges. This might be the reason for the reduction in number of double exchanges as well as the low frequency of exchanges in long arm euchromatin of chromosomes 5 and 7 compared to short arm euchromatin. In view of the incomplete homologies between chromosomes of the two species, the pairing behavior in this sesquidiploid with regard to occurrence and distribution of partner exchanges might be different from that expected in an autotriploid, where the three chromosomes in each set are completely homologous.

Rick, C. M. and M. Holle Wild and feral species in southern Ecuador and Peru.

A project designed for collecting tomato species in southern Ecuador and northern Peru was undertaken in August-October 1980. The project was supported by IBPGR/FAO. The purpose was to make observations in the native habitats and sample germplasm of Lycopersicon and closely related Solanum, species in a region that has been searched to a limited extent previously and whose tomato species reserves were to a large extent unknown.

The trip to Ecuador was made in August throughout the Province of Loja, adjacent parts of Zamora-Chinchipe, and western Morona-Santiago. The dominant species throughout most of this area is L. hirsutum f. glabratum. We were surprised to encounter L. parviflorum for which species the distribution was extended from northern Peru through Provincia Loja into Azuay as far as Oña. L. pimpinellifolium was encountered inland as far eastward as La Toma. The cerasiforme-primitive cv. complex that we had collected previously in Macas and Sucua extends southward in the Oriente at least as far as Zamora. Several collections of S. juglandifolium and S. ochranthum were made in the eastern Andean slopes. The preferences of both for wet, even swampy, sites were evident in these populations.

The excursion into northern Peru lasted for a longer period in September and October and covered considerably more territory, principally in Depts. La Libertad, Cajamarca, Amazonas, and San Martín. The third successive year of a devastating drought did not help much with our collecting in the sierra. Our collections of L. hirsutum are notable in that they extend the range of f. glabratum well into Peru along the eastern slopes and as far south as Chachapoyas. A stronghold of L. pimpinellifolium was encountered in the Jaen-Bagua region and another for L. parviflorum at intermediate elevations along Rio Utcubamba. A peruvianum-like taxon exists along parts of the Huancabamba, Chotano and Maranon watershed from Pongo de Rentema to Aricapampa. The semi-wild cerasiforme-primitive cv. complex was encountered at lower elevations in the Ceja de la Montaña from San Ignacio to Moyobamba and Tarapoto and probably extends further. As elsewhere these forms grade into each other to such an extent that delimitation of cerasiforme becomes completely arbitrary. The collections in the Altomayo and Bajomayo were notable for the extreme diversity of fruit shapes and for their success as weeds in newly cleared areas. We found populations of S. ochranthum widely scattered over the area at elevations of 2000-2500 m.

Most of our collections will be grown at Davis in 1981 for observation and stock increase, pending the success of which, supplies of seeds will be available for distribution.

Stamova, L. and M. Yordanov Genetic study of the gene Cf-2 for resistance to Cladosporium fulvum derived from different wild species.

As reported previously (TGC 28, 1978) in progenies of crosses with S pennellii and L. minutum we found lines resistant to races 1.3 and 4 but susceptible to races 1.2.3 and 2.3.4of Cladosporium fulvum (Fulvia fulva). In this material we observed autogenic necroses.

Similar necroses appeared also in some lines originating from crosses with L. cheesmanii (pimpinellifolium form, Galápagos) and L. chilense. These lines were also resistant to races 1.3 but susceptible to races 1.2.3 and 2.3.4.

According to existing references (Langford 1948) autogenic necroses connected with resistance to Cladosporium fulvum are manifested in case the Cf-2 gene from L. pimpinellifolium is combined with both recessive alleles ne/ne for necroses from the esculentum group.

To compare the resistance factors in the above lines with the gene Cf-2 from Vetomold, the allelic test was made. Furthermore, a separate nonreciprocal diallel cross was used with some of the necrotic lines.

The results presented in the table show that it is possible that all these accessions contain the same resistant gene allelic to Cf-2 in Vetomold. This will be studied further in F_3 and F_4 material and other lines from these crosses.

Cross	No. of plants R	S	Ratio	χ^2	P
352/76 (L.pimp) x ++	38	0	1:0		
352/76 x ++ ♀	68	20	3:1	0.12	0.50-0.80
354/76 (L. min) x ++	30	0	1:0		
354/76 x ++ ♀	59	17	3:1	0.14	0.50-0.80
1439/77(L. chil)x ++	28	0	1:0		
1439/77 x ++ ♀	62	24	3:1	0.36	0.50-0.80
1041/77(S. pen) x ++	32	0	1:0		
1041/77 x ++ ♀	70	20	3:1	0.36	0.50-0.80
Vetomold x 352/76 ♀	85	0	1:0		
Vetomold x 352/76 x ++	65	0	1:0		
Vetomold x 354/76 ♀	92	0	1:0		
Vetomold x 354/76 x ++	60	0	1:0		
Vetomold x 1439/77 ♀	81	0	1:0		
Vetomold x 1439/77 x ++	73	0	1:0		
Vetomold x 1041/77 ♀	88	0	1:0		
Vetomold x 1041/77 x ++	57	0	1:0		
352/76 x 354/76 ♀	98	0	1:0		
352/76 x 354/76 x ++	63	0	1:0		
1439/77 x 354/76 ♀	85	0	1:0		
1439/77 x 354/76 x ++	69	0	1:0		
1041/77 x 354/76 ♀	92	0	1:0		
1041/77 x 354/76 x ++	62	0	1:0		
1041/77 x 1439/77 ♀	84	0	1:0		
1041/77 x 1439/77 x ++	68	0	1:0		

Tanksley, S. D. Map positions of Prx-1, Skdh-1 and Pgm-1.

Previous studies have revealed that Prx-1 and Skdh-1 are about 24 cM apart on chromosome 1 with au being situated between the two isozyme loci. However, the orientation of these loci with reference to the centromere has not been determined. To decide this point, Prx-1 and Skdh-1 variants derived from S. pennellii (LA 716) by several backcrosses to L. esculentum were crossed to ms-32, a marker on chromosome 1 which maps near the centromere, 15 cM from au. The results, given below, indicate that Skdh-1 is closer to ms-32 than Prx-1. The reduced map distance between Skdh-1 and Prx-1 compared with the value obtained from our previous studies (24 cM) is probably due to the fact that the Skdh-1 and Prx-1 alleles used here were derived from S. pennellii. Wild chromosomes backcrossed several generations into esculentum are known to experience reduced recombination. These results combined with those previously published indicate the following orientation: Prx-1--7cM -- au --17 cM -- (Skdh-1, ms-32).

Prx-1	+	ms-32
+/+	1	65
+/p	69	5

r = 0.044 = 4.4 cM
(r = max. likelihood estimate)

Skdh-1	+	ms-32
+/+	0	63
+/p	74	0

r = 0

Pgm-1 is the nuclear gene coding for chloroplastic phosphoglucomutase. Linkage has been detected with three markers on chromosome 3--sy, sf, Prx-7. Pgm-1^{1} was crossed to testor stock sy^{1}--sf^{+}, Pgm-1^{+} and backcrossed to the testor. An additional cross was made to Prx-7^{1} and an F_2 generation produced.

	Pgm-1 +/+	Pgm-1 +/1
sy sf	17	1
sy +	8	0
+ sf	1	19

sy -- Pgm-1 = 4/58 = 7 cM
sf -- Pgm-1 = 21/58 = 36 cM
sy -- sf = 19/58 = 33 cM

Pgm-1	Prx-7 +/+	Prx-7 +/1
1/1	16	1
+/1	0	42
+/+	0	14

r = 0.01 = 1 cM

These data suggest Pgm-1 is distal to sy and maps very close to Prx-7.

Taylor, I. B. Mapping the ls locus. According to the most recent linkage summary (TGC 30) the ls locus has been placed at position 132 of chromosome 4. For a number of reasons I wanted to combine ls and flc to form a double homozygote. I have been unable to detect any ls ls flc flc individuals in the F_2 and suggest that these two gene loci should be allocated to the same map position. There are no marker genes within 43 map units of the suspected ls site on chromosome 4. In contrast, the presence of an incompletely dominant marker, La, only 11 map units away from the suspected flc site on chromosome 7, provides a means of testing the suggestion that both ls and flc should be placed on this chromosome at position 59.

As La is semi-lethal in the homozygous state, these genotypes have been excluded from the following F_2 segregation data from La/flc and La/ls crosses.

a) La+ flc+ x self

Phenotypes	++	La+	+flc	La flc
Observed	6	62	26	6
Unlinked exp.	25	50	8.5	16.5
Linked exp.	7	60	26.5	6.5

b) La+ ls+ x self

Phenotypes	++	La+	+ls	La ls
Observed	11	111	51	5
Unlinked exp.	44.5	89	15	29.5
Linked exp.	12.5	107	47	11.5

The predicted result from the TGC 30 map would be no linkage between La and ls. This assumption does not fit the observed data and gives a χ^2 of 137.41. By assuming that ls is located next to the flc locus (position 59, chromosome 7) and would therefore have an 11% recombination frequency in crosses with La, a much better fit is obtained (χ^2 = 4.34). The F_2 for the La x flc crosses confirms that these two loci are linked and can realistically be assumed to be 11 map units apart.

I therefore propose that the linkage map be amended with respect to the ls locus, which should be reassigned to the same position as flc on chromosome 7.

Valkova-Achkova, Z. and V. Sotirova Trigenomic hybrid between Lycopersicon esculentum Mill., L. chilense Dun. and L. peruvianum var. humifusum Mill. reproductive relationships and resistance to Corynebacterium michiganense (Smith) Jensen.

Our attempts to cross L. esculentum with L. peruvianum var. humifusum by means of embryo culture, hybridization on heteroploid level and other methods gave no result. The reproductive barriers between the two species have been overcome through bridge hybridization. The F_1 plants of the combination L. esculentum (isogenic line gf) x L. chilense were used as intermediaries. After pollination of these plants with pollen of L. peruvianum var. humifusum, four seeds were obtained and gave rise to F_1 plants of the trigenomic

hybrid L. esculentum - L. chilenese - L. puruvianum var. humifusum. It was easily crossed with var. humifusum (P_3)and considerably less easily crossed with L. esculentum (P_1) used as female parent (Table 1). With the aim of studying the reproductive relationships of BC_1P_1, self-pollination and backcross with the three parental species were made. With self-pollination, a large number of well-seeded fruits with normal seed viability were obtained, and they gave multiple F_1's of BC_1P_1 generation. The backcross with L. chilense (P_2) and L. peruvianum var. humifusum (P_3) was made without particular difficulties. The seeds obtained had over 75% viability.

The resistance of the three parental species and the trigenomic hybrid to Corynebacterium michiganense was studied. Unlike L. esculentum which is highly susceptible, L. peruvianum var. humifusum showed high resistance to C. michiganense. In comparison to L. peruvianum var. humifusum, L. chilense exhibited lower resistance. The $F_1BC_1P_1$ plants differed among themselves in morphological traits as well as in resistance to C. michiganense. The accumulation of genes originating from the two wild parental species provided the obtainment of a considerable number of plants with different degrees of resistance. Those with highest resistance were used for making backcrosses with L. esculentum.

Table 1. Obtainment and reproductive relationships of the bridge hybrid F_1 (L. esculentum x L. chilense) x L. peruvianum var. humifusum.

Hybrid combination	No. poll. flowers	% frts. with hybrid seeds	Ave no. of seeds per fruit	Hybrid plts. per 100 poll. flowers
F_1 (L. esc. x L. chil.) x var. humifusum	283	4.6	1	14.3
F_1 (L. esc. x L. chil. x var. humifusum) x P_3	330	12.4	30.9	384.5
P_1 x F_1 (L. esc. x L. chil. x var. humifusum)	50	12.0	1.8	10.0
BC_1P_1 x L. chilense	24	16.6	1	16.6
BC_1P_1 x var. humifusum	110	6.3	14.6	92.7
L. esculentum x BC_1P_1	60	26.6	5.5	6.0
BC_1P_1 ⊛	130	54.6	23.7	730.0

P_1 = L. esculentum, P_2 = L. chilense, P_3 = L. peruvianum var. humifusum, ⊛ = self-pollination

ANNOUNCEMENT

Zamir, D. and R. A. Jones Estimates of the number of pollen grains applied to a stigma in a single pollination.

The number of pollen grains applied to a stigma in a single pollination greatly exceeds the number of ovules in the flower's ovary. The number of fertilized ovules can be estimated by counting the seed produced per fruit. However, estimates of the number of pollen grains which compete for the precious few ovules are unavailable. The purpose of this study was to estimate how many pollen grains are applied to the surface of the stigma in a single pollination, and, of those, how many are effective in fertilization.

Plants of a male-sterile (ms 10^{35}) tomato breeding line served as the pistillate parents for controlled crosses. The pollen sample was weighed before and after pollination of 360 flowers. Pollinations were performed by dipping the stigmas in pollen contained in a gelatin capsule. The mean pollen wt applied to a stigma was $6X10^{-6}$ mg. To determine the wt of a single pollen grain, 25 mg of pollen was suspended in a glycerol/water (25:25 ml) solution and magnetically stirred for 1 hr. Using a haemacytometer, pollen grain numbers were determined in 40 subsamples of 7 µl each. The mean number of grains in the subsamples was 590. From this dilution experiment the mean wt of a single grain was calculated to be $6X10^{-6}$ mg. Thus from the wt of the pollen applied to a single stigma and the mean individual pollen wt, we can estimate that about 10,000 pollen grains were applied to a stigma of the male-sterile plant.

A different approach was to estimate the number of pollen grains covering the area of the stigmatic surface. Pollen grain and stigma diameter were measured by microscopy. The mean diameter of a single pollen grain was 0.021 mm and the mean stigma diameter was 1.2 mm. As the stigmatic surface is of irregular shape and contoured with papillae, the total surface was assumed to approximate that of half a sphere of diameter 1.2 mm. Further assuming that the packing of the pollen grains is in the form of a cubic lattice, it would take approximately 5,000 pollen grains to cover the stigma surface with a monolayer of grains. The larger estimate for the pollen grain numbers applied to a stigma in the pollination experiment is probably due to the deviations from the spheric surface and expected deviations from the monolayer assumption. However, these two independent approaches provide a reasonable estimate for the magnitude of pollen grain numbers applied to a single stigma.

The mean number of seed produced in individual fruit of the male-sterile line was 90. Taking the lower estimate for the number of pollen grains covering the stigma, then only about 2% of the grains are successful in fertilization. In crosses where the pollen source is derived from a heterozygous plant, it is possible that the gametes which effect fertilization do not represent a random sample of the total gamete population. Natural selection acting during pollen germination and tube growth may favor particular pollen genotypes.

ANNOUNCEMENT

Plant Molecular Biology Newsletter - A new newsletter concerning the molecular biology of plants began publication in June 1980 and will appear at least three times a year. Research notes are particularly welcome from members of TGC. Address inquiries to Editor-treasurer Dr. M. R. Hanson, Plant Molecular Biology Assoc., P.O. Box 5502, Charlottesville, VA 22905, USA.

PART II

STOCK LIST

Stocks Available

Regional Plant Introduction Station Ames, Iowa 50010 c/o W.H. Skrdla	The world collection of tomato introductions for the Crops Research Division ARS, USDA is maintained: species, hybrids, named varieties as well as foreign introduction of L. esculentum and certain genetic marker stocks.
Tomato Genetics Stock Center Department of Vegetable Crops University of California Davis, CA 95616	Misc. genic stocks; modern & primitive cultivars; and chromosomal stocks (507 items) - TGC 29:40-47.
	Species stocks (546 items) - TGC 30:38-49 (revision of TGC 27 list)
	Monogenic mutants (628 items, revision and expansion of list issued in TGC 28) - TGC 31, list follows.
	Allele stocks (21 items) - TGC 31, list follows

Revised list of available gene stocks

The following list of accessions, comprising stocks of 628 monogenic mutants, is a revision of the list that was issued in TGC 28. Certain obsolete items have been dropped, and newly acquired gene stocks have been added. Although viable seeds of each listed accession are available, the supply of certain items is limited by short storage life or poor reproductivity. The lines are true-breeding except for male-steriles, other inherited sterilities, dominants that are homozygous inviable, etc., all of which are propagated via heterozygotes. Several stocks are offered for many of the genes; the first number is usually a non-combinant stock, the others, often combinations with other genes. A complete, revised list of the combination stocks and their component genes will be prepared for TGC 32. Additional information concerning the origin and other aspects of the stocks listed below will be furnished on request.

Symbol	Name ----------	Stock number
a	anthocyaninless	LA13, 982, 1113, and others
	(EMS-induced alleles)	3-141, 3-415
as	anthocyanin absent	LA1194, 1525, 1700
acr	acroxantha	LA933

Symbol	Name	Stock number
ad	alternaria resistance	LA1783
adp	adpressa	LA661, 882
adu	adusta	LA934
ae (a_{332})	entirely anthocyaninless	LA1048, 1191, 1491, 1666
aeg	aegrota	LA537
af (a_{325})	anthocyanin-free	LA1049, 1444
Af	Anthocyanin fruit	LA1996
afe	afertilis	LA935
afl (af)	albifolium	2-367, LA658, 911 and others
afr (ap)	anthocyaninless-fragile	LA1784, 1785
ag	anthocyanin gainer	LA177, 1192, 1445, and others
ah (ao)	Hoffman's anthocyaninless	LA260, 983, 1164, and others
	(spontaneous alleles)	LA352, 983
	(induced alleles)	3-302
ai (a_{342})	incomplete anthocyanin	LA1484
ai^2($am\ a_{340}$)	incomplete anthocyanin^2	LA1485
al (a_2)	anthocyanin loser	LA14, 897, 1443 and others
alb	albescent	LA807, 1111, 1177
alu	alutacea	LA838
an (an^1,an^2,ca)	anantha	LA536
ap	apetalous	2-9
apl	applanata	LA662
apn	albo-punctata	3-105
aps-1^n	acid phosphatase-1^n	LA1810
aps-1^1	acid phosphatase-1^1	LA1811
aps-1^2	acid phosphatase-1^2	LA1812
aps-2^n	acid phosphatase-2^n	LA1813
aps-2^1	acid phosphatase-2^1	LA1814
aps-2^2	acid phosphatase-2^2	LA1815
aps-2^3	acid phosphatase-2^3	LA1816
are	anthocyanin reduced	3-73; LA1526
as-3	asynaptic-3	2-101
as-5	asynaptic-5	2-149
as-6	asynaptic-6	2-167
at	apricot	LA215, 347, 499
atn (at)	attenuata	LA587
atv	atroviolacium	LA797, 801
$au^{(ls)}$(brac)	$aurea^{(ls)}$	LA538, 641, 775,783
au^{tl}	Torrey Lyon's aurea	2-655A; LA1184, 1185, & others
aud	auroid	LA1008, 1171
aus	austena	LA2023
aut	aureata	LA1067, 1175
auv	aureate virescent	3-75
avi	albovirens	LA936
aw (aba,ab,a_{179})	without anthocyanin	LA271, 514, 790, and others
	(EMS-induced allele)	3-121

Symbol	Name	Stock number
B	Beta-carotene	LA316
bc (bi)	bicolor	LA588
bi	bifurcate inflorescence	LA1786
bip	bipinnata	LA663, 1699
bk	beaked	LA330, 986
Bk-2	Beaked-2	LA1787
bl	blind	LA59, 189
$bl^2(to^2)$	$blind^2$	LA980
bls (alm)	baby lea syndrome	LA1004, 1195, 1071 and others
bn	blunt	LA1997
br	brachytic	LA2069, 1221, 52, and others
bs	brown seed	LA1157, 1492
bs-2	brown seed-2	LA1788
bs-4	brown seed-4	LA1998
btl	brittle	LA1999
bu	bushy	LA897, 1179, 1666, and others
$bu^{ab}(fru)(fru^{ab})$	$bushy^{abbreviata}$	LA549
$bu^{cin}(cin)$	$bushy^{compact\ inflorescence}$	LA1437
bul	bullata	LA589
buo	bullosa	LA2000
c	potato leaf (radiation induced allele)	LA13, 905, 1178, and others 3-345
car_2	$carinata_2$	LA539
car^2	$carinata^2$	LA2001
cb-2	cabbage leaf-2	LA2002
cg	congesta	LA831
ch	chartreuse	2-253; LA345, 497
ci	cincta	LA938
cit	citriformis	LA2024
cjf	conjunctiflora	LA1056
ck	corky fruit	LA2003
Cl	Cleistogamous	2-84
cl-2	cleistogamous-2	2-185; LA189
cla	clara	LA540
clau (ff, vc)	clausa (spontaneous alleles)	LA591, 917, 1445, and others 2-505, LA509, 896
cls	clarens	LA2025
clt	coaleta	LA2026
cm	curly mottled	LA272, 312, 347, and others
cma	commutata	LA2027
cn (ca)	cana	LA590, 1101, 1170
co	cochlearis	LA592, 1107, 1173, and others
coa	corrotundata	LA940, 1178, 1441
com	complicata	LA664, 914, 991, and others
con	convalescens	LA541, 909, 987, and others
cor	coriacea	LA666
cpa	composita	LA833
cpt	compact	2-377
Cri	Crispa	LA667
Crk	Crinkled	LA1050, 1176
cru	corrupta	LA941
cs	corollaless	LA1789

Symbol	Name	Stock number
cta	contaminata	LA939
ctt	contracta	LA2028
Cu	Curl	LA325
cu-2	curl-2	LA2004
cul	culcitula	LA2029
cur	curvifolia	LA668, 1070, 1105
cv (cu)	curvata	LA593
cv^2 (acu)	$curvata^2$	LA660
cva	conversa	LA665
cvl	convoluta	LA830
Cvx	Convexa	LA1151
d	dwarf	LA313, 13, 789, and others
$d^{im}(rob^{imm})$	(X-ray induced allele)	LA571
$d^{cr}(rob^{crisp})$	$dwarf^{crispata}$	LA570
	(EMS-induced alleles)	3-420, 3-422
d^x	$dwarf^{extreme}$	LA160
	(EMS-induced allele)	3-421
d-2 (rob_2)(rob II)	dwarf-2	LA625,1527
dc	decomposita	LA819
dd (d^{xx})	double dwarf	LA810
deb	debilis	LA542, 788, 882, and others
dec	decumbens	LA669
def	deformis	LA543
Del	Delta	LA1051
deli	deliquescens	LA595
dep	deprimata	LA544
depa	depauperata	LA596
det	detrimentosa	LA670
det^2	$detrimentosa^2$	LA820
dgt (lz-3)	diageotropica	LA1093, 1529, 1530 and others
di	divergens	LA599, 917, 1166, and others
dil	diluta	LA545, 777
dim	diminuta	LA597
dis	discolor	LA598
div	divaricata	LA671, 880
dl	dialytic	2-69; LA897, 1179 and others
dlb	dilabens	LA829
dm (d_2)	dwarf modifier	LA14
dmd	dimidiata	LA2033
dmt	diminutiva	3-7
dps	diospyros	LA1016
dpy	dumpy	LA811, 1168
	dumpy allele	LA1053
ds	dwarf sterile	2-247
dt	dilatata	LA828
dtt	detorta	LA2030
du	dupla	LA2034
dv	dwarf virescent	LA155, 156, 201, and others
e (b)	entire	LA159, 784, 886, and others
	allele	3-616

Symbol	Name	Stock number
eca	echinata	LA2035
ele	elegans	LA546, 723
ele^2(ang)	elegans^2	LA586
elu	eluta	LA547, 2031, 2039 and others
em	emortua	LA827
en	ensiform	LA1787
ep	easy peeling	LA1158, 1159
er	erecta	LA600
era	eramosa	LA850, 1082
Est-1^n	Esterase-1^n	LA1817
Est-1^1	Esterase-1^1	LA1818
Est-1^2	Esterase-1^2	LA1819
Est-1^3	Esterase-1^3	LA1820
Est-1^4	Esterase-1^4	LA1821
ete	extenuata	LA942
ex	exserted stigma	2-191
exa	expassa	LA853
exl (ex)	exilis	LA601
exs	excedens	LA852
f	fasciated fruit	LA14, 88, 167, and others
f^D	fasciated-dominant	LA767
fa	falsiflora	LA854
fcf	fucatifolia	LA945
fd	flecked dwarf	LA873, 1111, 1171
fe	fertilis	LA672
fgv	fimbriate gold virescent	LA1143
fir	firma	LA602
fla	flavescens	LA548
flc	flacca	LA673, 1083
fld	flaccida	LA943
fli	filiform inflorescence	LA1790
fn	finely-netted	LA2005
fr	frugalis	LA674
frg	fragilis	LA864, 1188
Frs (Nec)	Frosty spot	LA2070
frt	fracta	LA2038
fru^{hem} (bu^{hem})	fruticosa^{hemiglobosa}	LA604
fsc (dkv)	fuscatinervis	LA872, 1106
ft	fruiting temperature	LA2006
fu	fusiformis	LA605
fua	fucata	LA944
fug	fulgida	LA946
ful	fulgens	LA550, 784, 917, and others
ful^2	fulgens^2	LA843
ful-3	fulgens-3	LA1495
fus	fulgescens	LA2039
Fw	Furrowed	LA192
fx	flexa	LA2037

Symbol	Name	Stock number
ga	galbina	LA836
gas	gamosepala	LA947, 1173
gbl	globula	LA2032
Ge^{c}	Gamete eliminator-Condine Red	LA533
Ge^{p}	Gamete eliminator-Pearson	LA1187
gf	green flesh	LA2071, 507, 508
gh (ab)	ghost	LA295, 646
gh-2	ghost-2	LA2007
gi	gibberosa	LA2040
gl	glauca	LA675
glau	glaucescens	LA606
glb	globularis	LA677
glc	glaucophylla	LA676
glf	globiformis	LA948
glg	galapagos light green	LA1059, 1442
glm	glomerata	LA2031
glo_{2}	$globosa_{2}$	LA551
glo^{2} (inx)(intro)	$globosa^{2}$	LA612
glu	glutinosa	LA842
gm	gamosepalous	LA2008
$Got\text{-}1^{1}$	Glutamate oxaloacetate $transaminase\text{-}1^{1}$	LA1822
$Got\text{-}1^{2}$	Glutamate oxaloacetate $transaminase\text{-}1^{2}$	LA1823
$Got\text{-}2^{n}$	Glutamate oxaloacetate $transaminase\text{-}2^{n}$	LA1824
$Got\text{-}2^{1}$	Glutamate oxaloacetate $transaminase\text{-}2^{1}$	LA1825
$Got\text{-}2^{2}$	Glutamate oxaloacetate $transaminase\text{-}2^{2}$	LA1826
$Got\text{-}2^{3}$	Glutamate oxaloacetate $transaminase\text{-}2^{3}$	LA1827
$Got\text{-}2^{4}$	Glutamate oxaloacetate $transaminase\text{-}2^{4}$	LA1828
$Got\text{-}3^{n}$	Glutamate oxaloacetate $transaminase\text{-}3^{n}$	LA1829
$Got\text{-}3^{1}$	Glutamate oxaloacetate $transaminase\text{-}3^{1}$	LA1830
$Got\text{-}3^{2}$	Glutamate oxaloacetate $transaminase\text{-}3^{2}$	LA1831
$Got\text{-}3^{3}$	Glutamate oxaloacetate $transaminase\text{-}3^{3}$	LA1832
$Got\text{-}4^{n}$	Glutamate oxaloacetate $transaminase\text{-}4^{n}$	LA1833
$Got\text{-}4^{1}$	Glutamate oxaloacetate $transaminase\text{-}4^{1}$	LA1834
$Got\text{-}4^{2}$	Glutamate oxaloacetate $transaminase\text{-}4^{2}$	LA1835
Gp	Gamete promoter	LA1791
gq	grotesque	2-181, 2-509, LA137
gra	gracilis	LA607
grc	gracillama	LA950

Symbol	Name	Stock number
grf	grandifructa	LA951
grl	gracilenta	LA949
gro	grossa	LA2041
gs	green stripe	LA212, 296, 1784
h (H)	hairs absent	LA154, 328, 780, and others
he	heteroidea	LA679
Hero	Resistance to potato eelworm	LA1792
hg	heterogemma	LA837
hi	hilara	LA952
hl	hairless	LA291, 925, 982 and others
	(EMS-induced alleles)	3-95, 3-126, 3-605
hl^2(cal)	$hairless^2$	LA937
hp (hp_1,hp_2,bs,dr)	high pigment	LA279, 875, 876, 1164
Hr	Hirsute	LA895
Hrt	Hirtum	LA501, 796
ht	hastate	2-295; LA638, 912 and others
hy	homogeneous yellow	LA1142, 1192
ic	inclinata	LA682, 683
ica	icana	LA2042
icn	incana	LA1009, 1110, 1116 and others
ics	incisifolia	LA1054
id	indehiscens	LA684
ida	inordinata	LA2043
ig	ignava	LA608, 923, 996, 1083
im	impatiens	LA863
imb	imbecilla	LA552, 724
imp^{dia}	$impedita^{distincta}$	LA680
imp^{eg}	$impedita^{extigua}$	LA681
in	indiga	LA610
ina	inflexa	LA840
inc	incurva	LA609
inf	infirma	LA553
ini	inquieta	LA953, 1488
ino	involuta	LA954
ins	inconstans	LA841
int	integerrima	LA611
inv	invalida	LA554, 1186, 1529, and others
Ip	Intense pigment	LA1500, 1501, 1563, 1664
irr	irregularis	LA613
ita	inquinata	LA839
j (lf)	jointless	LA30, 14, 925, 1113, and others
j-2	jointless-2	LA315, 345, 497
$j\text{-}2^{in}$	$jointless\text{-}2^{incomplete}$	LA756
Jau	Jaundiced	LA719, 770, 894, 985
jug	jugata	LA555
jug^2	$jugata^2$	LA834
l (g)	lutescent	LA13, 983, 1179, and others
	(spontaneous alleles)	2-491, 2-611, 2-613
l^2 (l, rub)	$lutescent^2$	LA572

Symbol	Name	Stock number
l-2 (l-3, l_2)	lutescent-2	LA643, 642, 1002
La	Lanceolate	LA335, 717, 788, and others
lae	laesa	LA685
lan	languida	LA2044
lap	lamprochlora	LA955
lat	lata	LA556
le	lembiformis	LA956
lep	leprosa	LA957
lg (lme)	light-green	LA759, 760, 814 and others
lg-5(lm)(fy)(yt)	light green-5	LA757, 796, 1061, and others
li	limbrata	LA2045
Ln	Lanata	3-71; LA1430, 1663
lop	longipes	LA958
Lpg	Lapageria	2-561
ls	lateral suppressor	LA329
lt	laeta	LA835
ltf	latifolia	3-35A
lu	luteola	LA686
luc	lucida	LA557
lur	lurida	LA959
lut	lutea	LA558, 728, 907, 1112
Lx	Lax	LA505, 769
lyr	lyrate	LA763
m	mottled	LA157, 789, 287, and others
m-2 (mo)(md)	mottled-2	LA651, 773, 802, and others
ma	macrocarpa	LA687
mac	maculata	LA960
mad	marcida	LA961
mar	marcescens	LA688, 884
marm	marmarata	LA559, 1001, 1164, and others
$marm^2$	$marmarata^2$	LA844
mc	macrocalyx	LA159, 512, 1807
mcn	maculonecrotic	3-45, 3-46
mcr	multicolor	LA2047
mcs	macrosepala	LA2046
Me	Mouse ears	LA324, 639, 715 and others
med	mediocris	LA962
mel	melongenoida	LA963
mgn	marginal necrotic	3-25, 3-26
Mi	Meloidogyne incognita resistance	LA655, 656
mic	microcarpa	LA845
mn (mi)	minuta	LA614
mnt	miniature	LA892, 1109
mon	monstrosa	LA615
mor	morata	LA848
mps	miniature phosphorus syndrome	LA519
ms-2	male-sterile-2	2-31; LA291, 322, and others
ms-3	male-sterile-3	2-32
ms-4	male-sterile-4	2-33
ms-5	male-sterile-5	2-39
ms-6	male-sterile-6	2-44

Symbol	Name	Stock number
ms-7	male-sterile-7	2-89
ms-8	male-sterile-8	2-98
ms-9	male-sterile-9	2-121
ms-10	male-sterile-10	2-132; LA733
ms-10^{35} (ms-35)	male-sterile-10^{35}	2-517
ms-11	male-sterile-11	2-152
ms-12	male-sterile-12	2-161
ms-14	male-sterile-14	2-175
ms-15	male-sterile-15	2-193
ms-15^{26} (ms-26)	male-sterile-15^{26}	2-327
ms-16	male-sttrile-16	LA62
ms-17	male-sterile-17	2-225, LA342
ms-18	male-sterile-18	2-233
ms-23	male-sterile-23	2-273
ms-24	male-sterile-24	2-277
ms-25	male-sterile-25	2-313
ms-27	male-sterile-27	2-331
ms-28	male-sterile-28	2-355
ms-29	male-sterile-29	2-423
ms-30	male-sterile-30	2-455
ms-31	male-sterile-31	2-461; LA902, 1113, and others
ms-32	male-sterile-32	LA359, 1492, 1493
ms-33	male-sterile-33	2-511; LA901, 903 and others
ms-34	male-sterile-34	2-513
ms-38	male-sterile-38	2-539
ms-38^{40} (ms-40)	male-sterile-38^{40}	2-553
ms-39	male-sterile-39	2-549
ms-44	male-sterile-44	LA2090
mt	midget	LA282
mta	mutata	LA965
mts	mortalis	LA849
mu	multinervis	LA690
mua	multifurcata	LA851, 1177, 1182
muf	multifolia	LA689, 891
mult	multiflora	LA560
mup	multiplicata	LA846
mut	mutabilia	LA866
muv-2 (mus)	multivalens-2	LA964
mux	multiplex	LA847
na	nana	LA561
nc	narrow cotyledons	LA170
neg	neglecta	LA562, 729, 781, and others
ni	nitida	LA616
nor	non-ripening	LA1793
not	notabilis	LA617, 924, 997, and others
Nr	Never ripe	LA162, 297
nv	netted virescent	LA786, 1000
o	ovate	LA330, 754, 986
O^{1} (o1)	$Oval^{1}$	LA271
ob	obscura	LA691
obl	oblate fruit	LA1159

Symbol	Name	Stock number
oc	ochroleuca	LA692
Od	Odorless	LA292, 347, 499, 1018
og	old gold	LA294, 348, 500
og^{c}(Crn,Cr,crn-2,cr_2)	old gold^{crimson}	LA806
oli	olivacea	LA693
op	opaca	LA618
opa	opacata	LA966
or	ordinata	LA2048
os	oligosperma	LA868
ovi	oviformis	LA967
p	peach	LA157, 330, 754, 986
pa-2 (pa)	parva-2	LA970
pal	pallida	LA563
pap	paupercula	LA2050
par	parca	LA969
pas	pallescens	LA968
pat	parthenocarpic fruit	LA2013
pau	pauper	LA877
pcv	polychrome variegated	LA1199, 1528
pdc	pudica	3-47, 3-48
pds	phosporus deficiency syndrome	LA813, 1189, 1190
pe	sticky peel	LA759,1002
pen	pendens	LA694
per	perviridis	LA564, 908, 910, and others
pet	penetrabile	LA971
Ph (Pi_T)(TR)	Phytophthora infestens resistance (race T_o)	LA2009
pi	pistillate	2-137
pic	picta	LA620
pl	perlucida	LA867
pla	plana	LA695, 1100
pli	plicata	LA696, 987
pm	praematura	LA855, 2024, 2025 and others
Pn	Punctate	LA812, 998
pol	polylopha	LA697
pp	polyphylla	LA860
ppa	purpurea	LA2054
pr	propeller	LA326, 907
prc	procumbens	LA698
pre	pressa	LA2053
pro	procera	LA565, 730, 803
prt	protea	LA972
prun	prunoidea	LA566, 726
$Prx\text{-}1^{n}$	Peroxidase-1^{n}	LA1836
$Prx\text{-}1^{1}$	Peroxidase-1^{1}	LA1837
$Prx\text{-}1^{2}$	Peroxidase-1^{2}	LA1838
$Prx\text{-}1^{3}$	Peroxidase-1^{3}	LA1839
$Prx\text{-}1^{4}$	Peroxidase-1^{4}	LA1840
$Prx\text{-}1^{5}$	Peroxidase-1^{5}	LA1841

Symbol	Name	Stock number
Prx-2^{n}	Peroxidase-2^{n}	LA1842
Prx-2^{1}	Peroxidase-2^{1}	LA1843
Prx-2^{2}	Peroxidase-2^{2}	LA1844
Prx-2^{3}	Peroxidase-2^{3}	LA1845
Prx-3^{n}	Peroxidase-3^{n}	LA1846
Prx-3^{1}	Peroxidase-3^{1}	LA1847
Prx-3^{2}	Peroxidase-3^{2}	LA1849
Prx-$3a^{1}$	Peroxidase-$3a^{1}$	LA1849
Prx-4^{1}	Peroxidase-4^{1}	LA1850
Prx-4^{2}	Peroxidase-4^{2}	LA1851
Prx-4^{3}	Peroxidase-4^{3}	LA1852
Prx-4^{4}	Peroxidase-4^{4}	LA1853
Prx-4^{5}	Peroxidase-4^{5}	LA1854
Prx-4^{6}	Peroxidase-4^{6}	LA1855
Prx-4^{7}	Peroxidase-4^{7}	LA1856
Prx-4^{8}	Peroxidase-4^{8}	LA1857
Prx-4^{9}	Peroxidase-4^{9}	LA1858
Prx-4^{10}	Peroxidase-4^{10}	LA1859
Prx-4^{11}	Peroxidase-4^{11}	LA1860
Prx-4^{12}	Peroxidase-4^{12}	LA1861
Prx-4^{13}	Peroxidase-4^{13}	LA1862
Prx-4^{14}	Peroxidase-4^{14}	LA1863
Prx-4^{15}	Peroxidase-4^{15}	LA1864
Prx-4^{16}	Peroxidase-4^{16}	LA1865
Prx-4^{17}	Peroxidase-4^{17}	LA1866
Prx-4^{18}	Peroxidase-4^{18}	LA1867
Prx-4^{19}	Peroxidase-4^{19}	LA1868
Prx-4^{20}	Peroxidase-4^{20}	LA1869
Prx-4^{21}	Peroxidase-4^{21}	LA1870
Prx-4^{22}	Peroxidase-4^{22}	LA1871
Prx-4^{23}	Peroxidase-4^{23}	LA1872
Prx-7^{1}	Peroxidase-7^{1}	LA1873
Prx-7^{2}	Peroxidase-7^{2}	LA1874
Prx-$7a^{n}$	Peroxidase-$7a^{n}$	LA1875
ps (va)	positional sterile (spontaneous allele)	LA63, 169, 511, 471 2-303
ps-2	positional sterile-2	LA2010
psa	perspicua	LA2051

Symbol	Name	Stock number
pst	persistent style	2-5; LA190, 296
pt-4	pseudo-triplo-4	LA892
pta	partiaria	LA2049
ptb	protuberant	LA1017, 1018
pu (pul)	pulvinata	LA621
pu-2	pulvinata-2	LA973
pum	pumila	LA567, 883, 1001
pun	punctata	LA974
pur	purilla	LA568
px	praecox	LA856
py	pyramidalis	LA2055
r	yellow flesh	LA13, 508, and others
	(spontaneous alleles)	2-141, LA353
r-2	yellow fruit color-2	LA2056
ra	rava	LA569
ra^2(gri)	$rava^2$	LA678, 902, 917, and other
re	reptans	LA624
rela	relaxata	LA622
rep	repens	LA623
rep-2	repens	LA2057
res	restricta	LA1084, 1085
ri	ridged	LA1794
ria	rigidula	LA825, 1078
ria^2	$rigidula^2$	LA975
rig_2	$rigida_2$	LA699
rig^2(pca)	$rigida^2$	LA822
rin	ripening inhibitor	LA1795
roa	rotundata	LA976
rot	rotundifolia	LA700
Rs	Rootless	LA1796, 1797, 1798
rtd	retarded dwarf	LA1058
ru	ruptilis	LA626, 988, 1070
rust	rustica	LA573
rv	reticulate virescent	LA285, 299, 648, 779
rv-2	reticulate virescent-2	LA2011
rv-3	reticulate virescent-3	3-33
rvt	red vascular tissue	LA1799
s	compound inflorescence	LA330, 986
sa	sphacelata	LA865
sar	squarrulosa	LA978
scf	scurfy	LA767, 1186, 1491, and others
scl	seasonal chlorotic lethal	LA1007
sd	sundwarf	LA15, 140
Se	Septoria resistance	LA1800
sem	semiglobosa	LA701
ses	semisterilis	LA826
sf	solanifolia	2-311, LA497, 1180, and others
sf^{wl}	$solanifolia^{wrinkled\ leaf}$	LA2012
sfa	sufflaminata	LA862
sha	short anthers	LA2013
si	sinuata	LA993
sit	sitiens	LA574
sl	stamenless	LA269

Symbol	Name	Stock number
sl-2	stamenless-2	LA1801
slx	serrate lax leaf	LA503, 801,
Sm	Stemphyllium resistance	LA1802
sn	singed	LA2015
so	soluta	LA2058
sp	self-pruning	LA154, 201, 302 and others
spa	sparsa	LA703, 805, 922, and others
spe	splendida	LA977
sph	sphaerica	LA704
spl	splendens	LA821, 2023, 2026 and others
squa	squarrosa	LA627
sr	slender stem	LA1803, 1804, 1805
ss	spongy seed	LA2016
st	sterile	LA334
sta	stabilis	LA2060
ste	sterilis	LA705
stri	stricta	LA575
sua	suffusa	LA707
sub	subtilis	LA576
suc	succedanea	LA706
suf	sufflava	LA577, 732
sup	superba	LA2061
sy	sunny	LA741, 1071, 1430, and others
(ye)	(spontaneous allele)	LA1434
syv	spotted yellow virescent	LA1096
t	tangerine	LA30, 159, 328,and others
t^v	tangerine^{virescent}	LA351, 649, 711 and others
ta	tarda	LA708
tab	tabescens	LA629, 1102
tc	turbinate corolla	LA2017
te	terminata	LA861
tem	tempestiva	LA979
ten	tenuis	LA578, 1086
tf (ct)	trifoliate	LA512, 1444, and others
tf^2 (tri)	(X-ray induced allele)	LA579
ti	tiny plant	LA1806, 1807, 1808
tl	thiaminless	LA758, 879
$Tm\text{-}2^a$	Tobacco-mosaic virus resistance-2 of Alexander	LA1791
tmf	terminating flower	LA1535
tn	tenera	LA2062
to	torosa	LA709
tp	tripinnate leaf	LA895, 999
tr	truncata	LA710
trs	tristis	3-57
u	uniform ripening	LA643, 1022, 1785, and others
ub	umbraculiformis	LA2063
uf	uniflora	LA1055, 1200
ug (u_2)	uniform gray-green	LA21, 297
um	umbrosa	LA630, 995, 996 and others
uni	unicaulis	LA580

Symbol	Name	Stock number
va^{dec}	$varia^{decolorata}$	LA581
va^{virg}	$varia^{virgata}$	LA582, 776
var	variabilis	LA583, 908, 1103, and others
Ve	Verticillium resistance	LA490
ven	venosa	LA584, 787, 888, 890
ver	versicolor	LA632, 994, 1074, 1075
ves-2 (vf)	versiformis-2	LA1078, 1079, 1080, 1489
vg	vegetative	LA140
vga	virgulta	LA858
vi	villous	LA759, 760
vio	violacea	LA633
vir	viridis	LA585
vit	vitiosa	LA634
vlg	virescent light green	3-128
vms	variable male-sterile	2-219; LA312, 796
vo	virescent orange	LA1435
vra	viridula	LA857
vrd	viroid	LA1005
vt	vieta	LA2064
w	wiry	LA274
w-3 (w_2)	wiry-3 (Lesley)	LA1498
w-4	wiry-4	2-237; LA1077
w-6	wiry-6	LA2065
wd	wilty dwarf	2-110; LA137, 884
wf	white flower	LA23, 159, 644, and others
Wo	Wooly	LA53, 85, 298, and others
Wo^{m}	Morgan's Wooly	LA258, 715, 986 and others
Wo^{mz}	Wooly, Mel Zobel	LA1908
Wo^{v}	van Wert's Wooly	LA1531
wt	wilty	LA30, 285, 512 and others
wv	white virescent	LA659, 727, 768, and others
wv-2	white virescent-2	LA1150
wv-3	white virescent-3	LA1432
Xa	Xanthophyllic	LA158, 298, 328, 637
y	colorless fruit epidermis	LA13, 330, 725 and others
yg-4 (yl,yg_{333})	yellow-green-4	LA738, 740
yg-6	yellow-green-6	LA1486
yv	yellow virescent	LA55, 773, 802 and others
yv^2 (vel^2)	yellow $virescent^2$	LA981

Allele stocks

Stocks of alleles in addition to the original mutant stocks are available for some loci. These stocks are active and available but have not been symbolized because we are not aware of any features by which they can be distinguished from other alleles at the same locus. Since most of these alleles were induced or originiated by

spontaneous mutation from an inbred stock, they are effectively isogenic, hence useful for experiments in physiology and other research requiring similar mutant and normal lines for comparisons. Genes for which we have such stocks are:

a	ae	ah	alb	aw	bip	bls	c	clau	d	d^{cr}	c^{x}
dgt	dpy	e	hl	l	r	ru	sy	tl			

CORRECTIONS: LINKAGE REPORT, GENE LIST AND STOCK LIST

TGC 21
- p. 2 ana angustata (not angusta)
- p. 7 str striata (not stricta), TGC Ref #15 (not 9)
- p. 24 fld flaccida (not flaccid)

TGC 23
- p. 4 correct name for Cf[3] Cladosporium fulvum resistance[3]
  correct name for Cf-6 Cladosporium fulvum resistance-6

TGC 29
- p. 2 ags-2 is aegrescens-2

TGC 30

Linkage report
- p. 2 Adh 1 Adenosine should be Adh-1 Alcohol
- p. 10 Skdh-1 Shikemic should be Shikimic

Gene list p. 17
1. Change Sciari to Schiavi; correct name is blind[2]
2. Add the following reference citation to Cirulli & Alexander, 1966:
   A comparison of pathogenic isolates of Fusarium oxysporum f. lycopersici and different sources of resistance in tomato. Phytopath. 56, 11, p. 1301-1304.
3. Change Tronicka to Tronickova, 1962
   New type of functional male sterility in tomato
   Věd. Práce ústř. výzk. Úst. rostl. Výroby v Praze-Ruzyni (6), 29-39. [Czech.].

Stock list -
- p. 39 LA1030 change Antofagasta, Chile to Tacna, Peru
- p. 43 LA247 change Chavanillo to Chavinillo
- p. 44 LA1473 change Callahuama to Callahuanca
- p. 45 LA1694 change Cacahuhuasan to Cacachuhuasin
- p. 47 LA1520 add under site Huaura-Sayan
- p. 47 LA1588 change Loredo to Laredo
- p. 48 LA1676 change Huadguina to Huadquina

PART III
ADDITIONS AND CORRECTIONS TO THE LIST OF MEMBERS

(Last complete Directory in TGC #30)

A. New members

Agway Inc. - Vegetable Seed Farm, Box 356, Prospect, PA 16052
Araujo, Marcelo T., UEPAE/BSB EMBRAPA, Caixa Postal 11-1316, 70000 BrasiliaBrazil
Balgarska Akademia na Naukite, Biblioteka - Periodika, u1_. 7 Noemvri 1, Sofia, Bulgaria
Bradley, D.B., Research Building, Campbell Place, Camden, NJ 08101
Brown, Steven, 4228 Williams Hall, Dept. of Crop Sci., NCSU, Raleigh, NC 27650
Campo Agricola Exp. de Culiacan, Apdo Postal No. 356, Culiacan, Sinaloa, Mexico
Chen, Hang, Peking Vegetable Research Institute, Ben Jin Peking, China
Dahl, Gary, CNRA - Genetique, Route de Saint-Cyr, 78000 - Versailles, France
Dowling, Elizabeth, Dept. Genetics, Univ. of Calif., Berkeley, CA 94720
Evola, Stephen V., Dept. of Plant Breeding & Biometry, Cornell Univ., Ithaca, N. Y. 14853
Gargiulo, Jeffrey, BHN Research, Route 8, Box 700E, Naples, FL 33940
Goldsmith Seeds, Inc., 10 Creek Edge Road, Davis, CA 95616
Hallard, Jacques, Les acacias - Rue do roi Rene 8, La Menitre, 49250 Beaufort en-Vallee, France
Lemke, Carol, 412 Bradfield Hall, Cornell Univ., Ithaca, NY 14850
"Liliana Dimitrova" Hort. Exp. Sta., c/o C. Perez-Dominguez, Cervantes 8 e/ Ingles y D'Strampes, La Habana 5, Cuba
Lin, Steve S. M., U. of Illinois, 101 Veg Crops Bldg., Urbana, IL 61801
Maisonneuve, Brigitte, Sta. d'Amelioration des Plantes Maraicheres, Domaine St. Maurice, 84140 Montfavet, France
McCormack, Jeffrey H., Dept. of Biology, Univ. of Virginia, Charlottesville, Virginia 22901
Meerut University Library, Library Incharge, University Campus, Meerut (Up), India
Nickeson, Richard, Dir. Res., Campbell Soup Co. Ltd., 5589 Hurontario St., R.R. 6, Mississauga, Ontario, Canada L5M 2B5
Osorio, Juan M., Dept. of Plant Science, Univ. of Delaware, Newark, DE 19711
Pilowsky, Meir, Volcani Institute, Beit Dagan, Israel
Poncu, Jan, Res. Inst. for Veg. & Flwr. Crops, Genetics & Breeding Dept, 8268 Vidra, Ilfov, Romania
Prasad, Uday Raj, Veg Crops, UCD, Davis, CA 95616
Radin, David N., Dept. of Cell Biology, Univ. of Calif. Irvine, Irvine, CA 92712
Reed, Sandra M., Campbell Inst. for Res. & Tech., 2611 Branch Pike, Cinnaminson, NJ 08077
Res. Inst. for Cirtus & Subtropical Fruits, Attn: Director, Gardening Section, P. Bag X11208, Nelspruit TVL., 1200 South Africa
Roundtree, Rex, Forerunner Farm Systems, 2213 Bandywood Dr., Nashville, TN 37215
Sato, Shigeru, Kagome Research Inst., Nishinasuno-Nasu, Tochigi, Japan
Sawhney, V. K., Biology Dept., Univ. of Saskatchewan, Saskatoon, Saskatchewan, S7N OWO
Sharp, W. R., Campbell Inst. for Res. & Tech., 2611 Branch Pike, Cinnaminson, NJ 08077
Sink, Kenneth C., Dept. of Horticulture, Michigan State Univ.,East Lansing, Michigan 48824

Stilwell, Martin R., Av. da Republica, 52,7^{0}, 1000 Lisboa, Portugal
Union Carbide Corporation, Tarrytown Technical Center, Library & Technical Information Center, Tarrytown, NY 10591
U.N. Dev. Programme, Resident Representative, P.O. Box 224, Ramna, Dacca, Bangladesh
Wasserman, Steven S., Dept. of Biology, Univ. of Virginia, Charlottesville, VA 22901
Widholm, J. M., Dept. of Agronomy, Univ. of Illinois at Urbana-Champaign, Urbana, IL 61801
Wong, James R., Dept. of Botany, Ohio State Univ., Columbus, Ohio 43210
Zambryski, Patricia, Dept. of Biochem. & Biophysics, Univ. of Calif, San Francisco, CA 94143

B. Address changes or corrections

Augustine, Jimmy, BHN Research, Rt. 8, Box 700 E, Naples, FL 33940
Briggs, Carroll G., Nickerson IPB Seeds, 7901 Westwood D-3, Gilroy, CA 95023
Courtney, W.H., III, Dept. of Plant Science, Univ. of British Columbia, 2357 Main Hall, Vancouver, B.C., Canada V6T 2A2
Hernandez-B., Guillermo, INIA, CIANOC, Apartado Postal 453, Ocampo 190, Desp.101, Veracruz, Ver., Mexico
Hewitt, John D., Agronomy Dept., Bradford Hall, Cornell Univ., Ithaca, NY 14853
Juvik, J. A., c/o J. Rudich, Hebrew Univ. Dept. Field & Veg Grops, Rehovot, Israel, 76-100
Kanwar, Jagwant S., Dept. of Veg Crops & Floriculture, Punjab Agric. Univ., Ludhiana, 141004 Punjab, India
Kesicki, Eugeniusz, Inst. of Plant Genetics, Polish Acad. Sciences, ul. Strzesynska 30/36, 60-479 Poznafi, Poland
Kim, Seung-Jin, Hort. Exp. Station, Office of Rural Development, Suweon, Korea
Medina-Filho, Herculano P., Instituto Agronomico C.P.28, Secoa Genetica, 13.100 Campinas SP, Brazil
Meredith, Carole P., Dept. Viticulture & Enology, Wickson Hall, Univ, of Calif., Davis, CA 95616
Paul, Elizabeth, Nat. Veg. Res. Station, Wellesbourne, Warwick CV34 9EF, England
Rao, Panuganti N., Univ. of Dar es Salaam, Dept, of Botany, P.O. Box 35060, Dar es Salaam, Tanzania
Rendon-Poblete, Edgar, Nat'l, Coord. of Veg Crops, INIA, Apartado Postal 356, Culiacan, Sin., Mexico
Yu, Albert, c/o Know You Seed Co., 26 Chung-Cheng, 2nd Road, Kao-Hsiung, Taiwan, Republic of China

PART IV

FINANCIAL STATEMENT

January 1, 1980 - December 31, 1980

		Total
Balance from 1979		$1,391.08
Receipts		
Assessments	$773.43	
Sale of back issues	383.21	
NSF Grant funds for publishing stock lists	220.77	$1,377.41
		$2,768.49
Expenditures		
Printing Report #30	$1,114.87	
Postage	284.78	
Xerox	1.00	
Invoice pads	1.70	
Envelopes	6.50	$1,408.85
Balance		$1,359.64

MEMBERSHIP STATUS

(to December 31, 1980)

Assessments paid for	1980	148
	1981	112
	1982	55
	1983	15
	1984	14
	1985	4
	1988	2
	1989	1
	1990	2
	1993	1
	Total	354

APPENDIX

Interim Report of the Committee on Varietal Pedigrees 1980

Listing of previous report: TGC 9:1959 - an attached supplement between pages 36 and 37. TGC 11:36-51, 1961.

TGC 16:53-67, 1966. TGC 18:64-71, 1968. TGC 19:39-45, 1969.
TGC 20:79-86, 1970. TGC 21:61-64, 1971. TGC 22:47-52, 1972.
TGC 23:49-56, 1973. TGC 24:46-52, 1974. TGC 25:36-41, 1975.
TGC 26:33-38, 1976. TGC 27:59-68, 1977. TGC 28:42-48, 1978.
TGC 29:58-62, 1979.

COMMITTEE ON VARIETAL PEDIGREES

Alexander, L. J.
Andrasfalvy, András (Hungary)
Angell, F. F.
Báldy, B. (Hungary)
Cirulli, M. (Italy)
Crill, J. P.
Darby, L. A. (England)
Daskaloff, C. (Bulgaria)
Frankel, Rafael (Israel)
Frazier, W. A.
Gabelman, W. H.
Gilbert, J. C.
Graham, T. O.
Groszmann, H. (Australia)
Hernandez, T. P.
Honma, Shigemi
John, C. A.
Kooistra, E. (Holland)
Lambeth, V. N. (Chairman)
Leeper, Paul
Pecaut, M. (France)
Robinson, R. W.
Sumeghy, J. B. (Australia)
Tomes, M. L.

Berry, S. Z. and W. A. Gould. 1979 'Ohio 7663' Tomato. Hort Science 14 (4) :550-551

Ohio 7663

Pedigree:

(Ohio 2070 x C28) x Florida 2125-Dl-S2
|
Ohio 7163 (F5)

Characteristics:

Fruit: u, j2, oval shape, 70 g, crack u resistant.
Plants: sp, 1. Has high temperature setting ability (32°C day - 23°C, night).
Early processing variety suited for machine harvest. For coreless wholepack and product.

Berry, S. Z. and W. A. Gould. 1980. Release of Machine Harvestable Processing Tomato Variety OHIO 7681. Ohio Agric. Res. and Dev. Center Release Notice Dated 9/25/80.

Ohio 7681

Pedigree:

(Ohio 2170 x Bouncer)

x

{[(C28 x H1547) x Roma VF] x (C28 x H1547)}

\

Ohio 7681 (F5)

Characteristics:

Fruit: u, blocky-deep globe, 100 g, crack resistant.

Plants: sp,1, Ve. Early processing variety suited for hand or machine harvest. For juice and product.

Boe, A. A., P. J. Pelofske and T. J. Bakken. 1980. 'Santa', 'Gem State' and 'Benewah' tomatoes. HortScience 15(4):536-537.

SANTA (Idaho 39-2)

Pedigree:

Payette x Uniset

1

P109 x Early Sub-Arctic

|

SANTA

Characteristics:

Fruit: Orange-red, 3-5 cm., slightly oblong, numerous, fruit exposed, set under cool temperatures.

Plants: Ultra-early, semi-determinate, sparce foliage. Foliage spread 20 cm. x 60-70 cm.

Ultra-early variety adapted to cool, short growing seasons or as winter cultivar in warm areas. For use in salads and as garnishes.

GEM STATE (Idaho 15)

Pedigree:

Pixie Hybrid (closed pedigree) x Sub-Arctic Midi

GEM STATE

Characteristics:

Fruit: Dark red, 4-5 cm., smooth, crack resistant, numerous.

Plants: Ultra-early, compact, sp, dwarf patio type foliage spread 25 cm. x 40-50 cm., coarse deep green foliage.

Ultra-early variety adapted to cool, short growing seasons or as winter cultivar in warm areas.

For use in salads and for home processing.

Pedigree:

Pixie Hybrid (closed pedigree) x Sun-Arctic Midi

BENEWAH

Characteristics:

Fruit: Bright red, slightly oblate, 6-7 cm. Quality comparable to other ultra-early and early cultivars.

Plants: Ultra-early, sp+, viney with good leaf coverage. Height 30-40 cm., spread 90-100 cm.

Ultra-early variety ripening before 'Early Girl Hybrid' and 'Sub-Arctic Maxi'. Fruit are suitable for salads, slicing and hone processing.

Honma, S., H. C. Price, H.H. Murakishi and C.L. Bedford. 1980. Mini-Spartan Tomato. Michigan Agri. Expt. Sta. Res. Rpt. 399.

MINI-SPARTAN

Pedigree:

$$\text{MSU 68-216}\left\{\left[\left[(\text{PI235673} \times \text{Spartan Red 8})_{F_2} \times \text{Potentate}\right]_{F_2} \times \text{VF 13L}\right]_{F_2} \times \text{Fla 1346-DIO-S3-D1-S1-DBK}\right\}_{F_3}$$

x

Tiny Tim

Mini-Spartan (F_8)

Characteristics:

Fruit: Red, 3/4-14 in. dia., crack resistant, j_2, numerous (100-150/plant), firm tough skin.

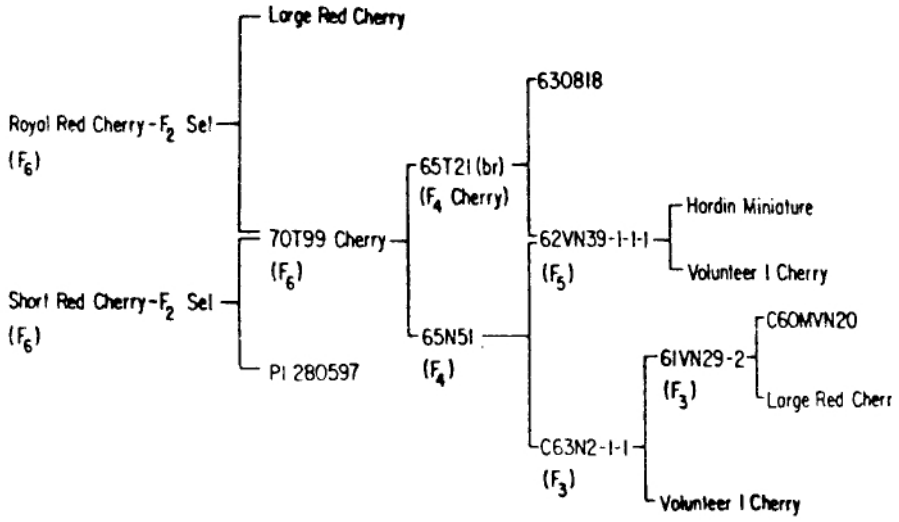
Plant: sp, spread about 3 ft. dia., good foliage cover, low to ground, Ve, I.

Midseason cultivar suited for fresh market, home garden, and for hanging baskets. Can be hand or machine harvested.

Jones, R. A., P. G. Smith, A. H. Millett, and K. A. Kimble. 1980. 'Royal Red Cherry' and 'Short Red Cherry' Tomatoes. HortScience 15(1):98.

ROYAL RED CHERRY (76VFT1)

Pedigree:



Characteristics:
Fruit: Deep red, spherical, smooth, 3.1-3.5 cm. borne in clusters of 6-12, slightly acid and sweet.
Plant: sp+, spread 3.0 m. dia., F, Ve, TM-2a, Alternaria.
Other: Maturity is 3-4 days earlier than Large Red Cherry.

SHORT RED CHERRY (76T164)

Pedigree: (same as Royal Red Cherry, above)

Characteristics:
Fruit: Bright red, spherical, 2-2.5 cm., sweet and slightly acid.
Plant: sp+, br, leaves smaller and more rugose than Royal Red Cherry, spread 2 m. dia., F, Ve, TM-2a, Alternaria, Mi
Maturity about 1 week earlier than Royal Red Cherry. For container gardens and conventional home gardener.

Kerr, E. A. 1980. Ontario Ministry of Agriculture and Food. Correspondence dated 12/9/80.
BASKETVEE (V 686C and Market Veebrite) Released 1977. HortScience 15:574.

Pedigree:
(Campbell 1402 x Coldset) x (Coldset x H1350)
|
Basketvee (sister sel of Veebrite)

Characteristics:
Fruit: Large, oblate red, firm, smooth, crack resistant, BER resistant, tending to bleach an exposed side.
Plant: sp, u, Ve,
Early midseason cultivar for fresh market and hand-pick processing for product.

VEEPRO (Ont. 746) Released 1977. HortScience 15:576.

Pedigree:
(Roma VF x H1350 x High Crimson)

x
St 8 (= Blitz x High Crimson 14) x Fla. 1339D3
|
Veepro

Characteristics:
Fruit: Red, medium size, square, u, og^c, 3_2.
Plant: sp, I, good cold germinating ability. Midseason cultivar for machine or hand picking, processing for product and whole pack.

CRIMSONVEE (Ont. 738) Released 1978. HortScience 15:575

Pedigree:
Veeset x (Roma VF x H1350 x High Crimson) x (High Crimson x Blitz)

Characteristics:
Fruit: Red, medium sized, heart to square shape, ug, og^c, very firm, thick walled. Outstanding color and viscosity.
Plant: sp, Ve, I,
Midseason, hand-pick cultivar for processing for product. Adapted Ontario and North Central states.

ONTARIO PINK 774. Released 1979.

Pedigree:
F_1 hybrid Ont. 7515 x Ont. 7519.
Ont. 7515 = Potentate/5/P.I. 124161/4/Ohio WR25/3/Ohio WR25/Ohio WR 25/Vendor//Ohio MR 12. Ont 7519 = Potentate/5/P.I. 126947/4/Ohio WR25/3/Ohio WR25//Weibull 8301-2-65/4/V6728/3/V6728/Ohio MR12//Vendor/5/Vantage/4/Vendor/3/Vendor. V6728=Derivative of U.S.D.A. 44B292/4/V469/5/V473/6/Vetomold/3/wf genetic line//Webb Special/3/Vulcan/Vantage.

Characteristics:
Fruit: Large, round, very smooth, pink fruit, u. Fruits set freely at 12.2°C night temperature and with minimum vibration.
Plant: sp+, h/+, Cf-7, Cf 19, $Tm\text{-}2^a$, I.
For greenhouse culture.

ONTARIO RED 775. Released 1979.

Pedigree:
F_1 hybrid - Ont. 7517x Ont. 7811.
Ont. 7517-Potentate/5/P.I.124161/4/Ohio WR25/3/Ohio WR25//Ohio WR25/Vendor//Ohio MR12.
Ont. 7811-Potentate/6/P.I. 126947/5/Ohio WR25/4/Ohio WR25/3/Vendor/4/Ohio MR12//Massachusetts #20/Vendor.

Characteristics:
Fruit: Large, red, round, very smooth, larger than Vendor, u, set freely at 12.2°C night temperature and with minimum vibration
Plant: sp+, Cf-7, Cf-21, $Tm\text{-}2^a$, I.
For greenhouse culture.

HARVESTVEE (Ont. 778) Released 1980.

Pedigree:

Harvestvee was developed from a cross made in 1972 between a breeding line and Veebrite. Its complex parentage traces back through breeding lines to 26 cultivars from which the earliest crosses were made in 1950. The parentage of Harvestvee is as follows: Kecskemeti Export//STEP 413/3/Viceroy/8/Moscow C14-10-3/7/Pocomoke/6/Ace/7/ Camdown/8/Farthest North/5/Break O'Day/11/Red Currant/10/ Oxheart/9/Break O'Day/11/Red Currant/10/Purdue 4759/8/ Rhode Island 52-342/9/Camdown/10/Farthest North/7/Oxheart/11/Pritchard/10/Earlinorth/9/Firebaii/8/H1350/6/Roma VF/8/H1350/9/High Crimson/7/Blitz/8/High Crimson 14/4/H1350/6/Burgess Crackproof/8/Wisconsin 55/7/Genetic marker br sp f wt j n/8/Potentate/9/Red Currant 6-02-M6/5/Libby C54/Veebflte.

Characteristics:

Fruit: Large, oblate, dark red, u, og C, crack resistant, firm with good holding ability. Blossom end may be corky in cold seasons.

Plant: sp, I, Ve. Highly tolerant to metribuzin herbicide.

For fresh market and hand-pick processing for juice and product.

BONNYVEE (Ont 777) Released 1980.

Pedigree:

Vision//Veeset/3/Roma VF/5/H1350/6/High Crimson/4/ St-8 (=Blitz/High Crimson 14)/Kecskemeti Export// STEP413.

Characteristics

Fruit: Red, medium size, u, Og^c, round, firm, very smooth, very small core, good crack resistance. Flavor excellent for a firm cultivar.

Plant: sp, I, highly tolerant to metribuzin herbicide.

For fresh market and hand-pick processing for juice, product and whole pack.

Trinklein, D.H. and V. N. Lambeth 1980. Origin and release of greenhouse tomato line Missouri 765 and Tuckcross Hybrid 756 p. Mo. Agric. Expt. Sta. Res. Bul. 1035.

MISSOURI LINE 765.

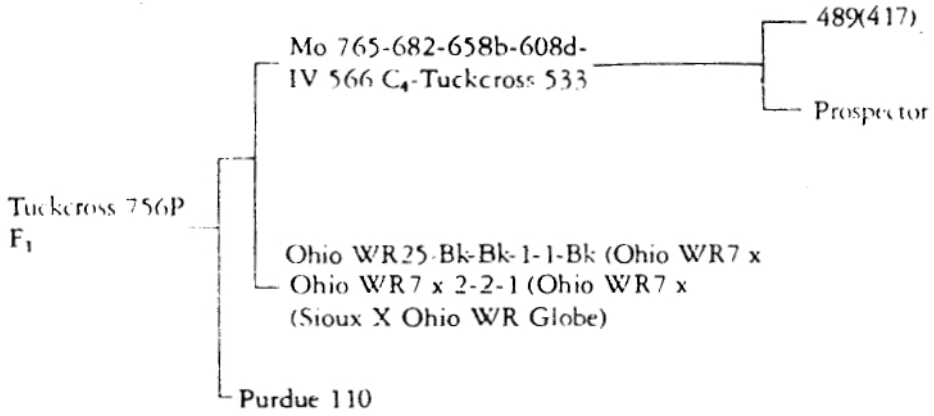
Pedigree: Line 765 is an F_6 selection of Missouri line 417[6] X Prospector[5].

Characteristics:

Fruit: Large (168-224 g.), pink, globe, smooth, pH 4.3, soluble solids 4.71%, CAE 0.2651%
Plant: sp+, sparce, open foliage, I, Cf.
For use in breeding large fruited greenhouse tomato hybrids.

TUCKCROSS HYBRID 756 p.

Pedigree:



Characteristics:

Fruit: Large (200+ g.), pink, globe-shaped, smooth tolerant to radial and concentric cracking.
Plants: sp+, sparce, open foliage canopy, I, Cf.
Adapted for greenhouse forcing at latitudes of 36-44^0 N.

REPORT
of the
TOMATO GENETICS COOPERATIVE

Number 31, June 1981

Department of Vegetable Crops
University of California
Davis, California 95616

Contents

Cover design from
advanced leaf of 6-week seedling
of the good old potato-leaf mutant c