REPORT
of the
TOMATO GENETICS COOPERATIVE

Number 4 January 1954

Department of Vegetable Crops
University of California
Davis, California

Contents

Foreword ........................................ page 1
Report of the Committee on Nomenclature .................. 2
List of tomato genes as of January, 1954 ............... 4
Part I. Research Notes .................................. 9
Part II. Directory of members .......................... 20
Part III. List of desired stocks ....................... 25
Part IV. Bibliography of papers on tomato genetics and breeding published in 1952 .......... 26
Part V. Financial statement .......................... 29
Corrigenda ........................................ 30

Cover design prepared by
Eduardo Alvarez
FOREWORD

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.

Aside from its usual functions, the main activity of the Tomato Genetics Cooperative during the past year has been to revise the list of nomenclatorial rules to be acceptable to a majority of members and to prepare a list of known genes, together with references and sources of stock. Both lists together with reports of the respective committees are presented in this Report. We wish to take this opportunity to thank these committees and all other members who assisted in completing this very useful service. We trust that members will join in the spirit of the Cooperative in following the recommendations of the Committee on Nomenclature and that we will thereby be spared some of the difficulties that have beset groups working with other organisms. If members know of any errors that should be corrected or additions made in the list of genes, we would be very grateful to learn of them. The usual list of available stocks is not included in this Report since most of this information is given in the sources indicated in the gene list.

Dr. L. Butler was elected to replace Dr. W. A. Frazier on the Coordinating Committee. In attempting to maintain regional representation on the Committee, we feel that the large group of foreign members, particularly from Canada, deserves representation to a greater extent at this time than the northwestern states.

Membership as of December 31, 1953 totalled 149, including 44 foreign members representing 21 different countries. Fifteen members listed in TGC No. 3 did not pay assessments for 1953; it is our unanimous opinion that no one should be kept on the membership roll or receive TGC Reports unless his assessment is paid for the respective year. New members joining during 1953 totalled 24, the net gain being 9.

The cost of issuing TGC No. 3 was much higher than that of previous Reports largely because it was a much larger Report and because nearly twice as many copies were prepared as the number of members. It is always difficult to decide how many copies should be issued, but, considering the turnover in membership and the sale of back numbers, we feel that the Cooperative and others will benefit in the long run by issuing a reasonable number of copies above the membership total. Three hundred copies of the present Report have been prepared. The cash balance as of December 31, 1953 was $67.42.

We gratefully acknowledge the willing help of the following people in preparing this Report. Dora Hunt, Eduardo Alvarez and Anand Sawant prepared the covers, assembled the Report, and helped in many other ways. Virginia Borelli and Ruby Akiyoshi typed the stencils.

Coordinating Committee

C. F. Andrus
C. M. Rick, Chairman
D. W. Barton
Department of Vegetable Crops
A. Burdick
University of California
L. Butler
Davis, California
Report of the Committee on Nomenclature

In the TGC report 3:4-5 (1953) this committee published a set of proposed Rules of Nomenclature which it hoped would be adopted by the membership. In the period following the issue of the report it became evident that there were some controversial items in the rules. In particular, Item 2, which concerns renumbering the linkage groups according to their respective chromosomes, was considered controversial. Also, Item 4, which concerns the use of the "+" system as opposed to the commonly used system of capitalizing the dominant expression and using small letters for the recessive expression, was not accepted by all of the membership. Since it is desirable for the rules to represent the desires of the majority of the membership, this committee, on November 15, 1953, distributed a mimeographed discussion of the controversial items to all of the membership. Also included with the mimeo was a post card which would enable each member to vote on the alternative proposals in controversy. The following is a summarization of this poll:

<table>
<thead>
<tr>
<th>Gene Nomenclature</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In favor of $sp-Sp$ scheme</td>
<td>21</td>
</tr>
<tr>
<td>In favor of $sp-sp^+$ scheme</td>
<td>33</td>
</tr>
<tr>
<td>Undecided</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numbering of Linkage Groups</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In favor of retaining existing linkage group numbers</td>
<td>9</td>
</tr>
<tr>
<td>In favor of numbers based on chromosome map</td>
<td>46</td>
</tr>
<tr>
<td>Undecided</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
</tr>
</tbody>
</table>

Since the results of this poll have indicated that a majority of the members favor the rules originally proposed by this committee, we now suggest that all of the rules proposed in the 1953 report be accepted as a standard for gene nomenclature.

During the past year several additions and corrections have been made in the list of nomenclatorial rules. We are therefore submitting herewith the revised list.

Rules of Nomenclature

1. **Chromosomes.** The chromosomes are numbered according to their length as measured in pachytene. Such numbers have already been applied (Barton, 1950), the longest being chromosome 1, the shortest, chromosome 12. In addition to length, such features as position of centromere, amount and distribution of heterochromatin serve to identify each chromosome.

2. **Linkage groups.** When the work of identifying linkage groups with chromosome is sufficiently far advanced that all groups can be referred to a definite chromosome, the linkage groups will be renumbered so that the linkage groups bear the same numbers as their respective chromosomes. In the meantime it is suggested that linkage groups continue to be designated by Roman numerals and chromosomes by Arabic numbers. For the present, the term "chromosome linkage group" should be reserved for only those cases which have been definitely established. Thus, chromosome 2 and linkage group I are identical (Barton, 1950) and will be designated chromosome linkage group 2 (I) when using the combined term, or simply as linkage group I when the chromosome is not mentioned.

3. **Genes.** Mutant genes are designated by letter symbols. The mutant name
comprises an adjective or noun or a combination of both that refers to the main
diagnostic feature of the phenotype. The initial letter of the symbol should be
the same as that of the name; additional appropriate letters are added as necessary
to distinguish it from other symbols already in use.

After obtaining reasonable evidence for the existence of a new gene for which
the phenotype can be distinguished reasonably well in some or all genotypic
milieux, the discoverer should select an appropriate name and symbol. Symbols that
have already been reported should never be knowingly applied to other mutations.

4. Alleles. Dominance or recessiveness of a mutant gene is indicated by
comparison with a "standard" or "normal" type. The variety Marglobe is proposed as
this normal type since it is widely grown and is typical of the general concept of
normal tomato morphology.

A mutant gene which is dominant to the normal type is written with the initial
letter of the mutant name and symbol capitalized, while one which is recessive to
the normal is written with all letters in small case. The normal allele of a
mutant gene is written with the symbol of the mutant gene followed by the super-
script "+". Thus the normal allele of sp is sp+ and of the mutant Wo is Wo+. A
dominant allele appearing later at the sp locus would be designated spD. Additional
alleles at the same locus are designated by appropriate letter superscripts; thus
for the d locus, the following alleles are known: d, dX, and d+. When it is clear
in the text which gene is concerned, the normal allele may be designated simply by
the "n" symbol.

5. Mimics. When new mutants are found which are indistinguishable pheno-
typically from other previously described mutants, these may be designated by the
name or symbol of the original mutant followed by a numerical subscript, the
original mutant being assigned the subscript "1", as already applied in the case
of male-sterile mutants, ms1, ms2, etc.

6. Translocations are designated by the symbol "Tn". The chromosomes involved
in translocations are designated by their respective numbers. In order to distin-
guish between translocations involving the same chromosomes, small-case letters are
used following the chromosome number, thus T(1-2)a, T(1-2)b, etc.

7. Inversions are designated by the symbol "In" while the chromosome in which
the inversion occurs is indicated by its respective number. Small-case letters are
used to distinguish different inversions on the same chromosome, thus, In(1)a,
In(1)b, etc.

8. Deficiencies are designated by the symbol "Df" and are distinguished in
the same manner as inversions (rule 7).

9. Primary trisomics are designated according to the extra chromosome present;
thus, "triplo-1n" refers to the primary trisomic of chromosome 1.

10. In order to distinguish between gene symbols and symbols of the chromosome
aberrations, the former are italicized.

11. Since chromosomes of all investigated species of Lycopersicon appear to be
almost completely homologous, it is suggested that the same symbolization apply to
the entire genus. It is also proposed that the complete gene symbols not be dup-
licated among the species unless the genes in question are known to be identical,
and the key letters of the symbols not be duplicated unless the genes are known to
be allelic. Species alleles can be designated by a superscript to indicate the
species, for example, ah for an allele in L. hirsutum.

Committee on Nomenclature

D. W. Barton, Chairman
L. Butler
J. A. Jenkins
List of Tomato Genes as of January 1954

At least 108 tomato genes have been described and 120 or more other inherited characters with undetermined inheritance are known. The following table lists the tomato genes and their synonyms to aid tomato breeders and geneticists in identifying tomato characters and to avoid further duplication of gene symbols. It is hoped that this alphabetical list will be accepted as a standard until a better one can be prepared later with the aid of additional information.

The list notes the main phenotypic characters and gives references to their descriptions. Synonyms are listed in parentheses after the priority gene-designation. When a symbol does not follow the revised nomenclatorial rules or has not become well established in the literature, it also is given in parentheses and it is hoped that in future publications these symbols will be changed. One or more seed sources for each gene is given whenever possible. The authors of the original publications may be able to supply seed stocks of the other genes. Anyone who can supply stocks of such genes is requested to tell C. M. Rick about them to aid in completing this list.

A number of new genes have been described only in TGC Reports. These are cited in this list by report and page number. Thus "TGC 3:5" means that a description of the gene will be found on page 5 of the 3rd report. Most authors will likely publish descriptions of these genes at a later date in standard publications.

<table>
<thead>
<tr>
<th>Gene symbol</th>
<th>Reference</th>
<th>Seed Source*</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>a (a₁)</td>
<td>I</td>
<td>B Y</td>
<td>Anthocyaninless; stems and leaves green, never purple.</td>
</tr>
<tr>
<td>ad</td>
<td>17</td>
<td>A</td>
<td>Resistance to <em>Alternaria</em> collar rot of young plants.</td>
</tr>
<tr>
<td>ag</td>
<td>TGC 4:9</td>
<td>B R</td>
<td>Andrus' green stem, anthocyanin appears on cotyledons and lower sides of leaves when growth is slow.</td>
</tr>
<tr>
<td>al (a₂)</td>
<td>1</td>
<td>B R</td>
<td>Anthocyanin loser, purple stems become green in 10 to 21 days.</td>
</tr>
<tr>
<td>an</td>
<td>3</td>
<td></td>
<td><em>Anantha</em>; flowers greatly modified; inflorescences compound; closely resembles ca Apetalous flowers; small corolla; pollen scarce and nonfunctional.</td>
</tr>
<tr>
<td>ap</td>
<td>13</td>
<td>R B</td>
<td>Asynaptic meiosis; high pollen and ovule sterility.</td>
</tr>
<tr>
<td>as₁</td>
<td>16</td>
<td>R</td>
<td>Asynaptic meiosis; high pollen and ovule sterility.</td>
</tr>
<tr>
<td>as₂</td>
<td>16</td>
<td>R</td>
<td>Asynaptic meiosis; high pollen and ovule sterility.</td>
</tr>
<tr>
<td>as₃</td>
<td>16</td>
<td>R</td>
<td>Asynaptic meiosis; high pollen and ovule sterility.</td>
</tr>
<tr>
<td>as₄</td>
<td>16</td>
<td>R</td>
<td>Asynaptic meiosis; high pollen and ovule sterility.</td>
</tr>
<tr>
<td>as₅</td>
<td>16</td>
<td>R</td>
<td>Asynaptic meiosis; high pollen and ovule sterility.</td>
</tr>
<tr>
<td>at</td>
<td>TGC 2:6</td>
<td>D</td>
<td>Apricot or yellow-pink flesh color.</td>
</tr>
<tr>
<td>aw</td>
<td>2</td>
<td>B</td>
<td>Without anthocyanin, green stem.</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>B Y</td>
<td>High B-carotene, low lycopene.</td>
</tr>
<tr>
<td>bk</td>
<td>1</td>
<td>B Y</td>
<td>Beaked fruits; sharp blossom-end points.</td>
</tr>
<tr>
<td>br</td>
<td>1</td>
<td>B R</td>
<td>Brachytic plants with short internodes.</td>
</tr>
<tr>
<td>bu</td>
<td>1</td>
<td>B Y</td>
<td>Bushy stems, short internodes, long petioles; spreading habits.</td>
</tr>
<tr>
<td>c</td>
<td>1</td>
<td>B Y</td>
<td>Potato leaf; reduced number of leaf segment.</td>
</tr>
<tr>
<td>Gene symbol</td>
<td>Reference</td>
<td>Seed Source*</td>
<td>Character</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>ca</td>
<td>9</td>
<td>D</td>
<td>Cauliflower; extremely branched inflorescence, aborted flowers.</td>
</tr>
<tr>
<td>cb</td>
<td>7</td>
<td>D</td>
<td>Cabbage leaf; large dark green leaves, 1-locule ovaries.</td>
</tr>
<tr>
<td>Cf₁(Cf₁c)</td>
<td>1</td>
<td>K</td>
<td>Resistance to Races 1 and 3 of Cladosporium fulvum.</td>
</tr>
<tr>
<td>Cf₂(Cf₂p₁)</td>
<td>1</td>
<td>K</td>
<td>Immunity to Races 1 to 4 of Cladosporium.</td>
</tr>
<tr>
<td>Cf₃(Cf₃p₂)</td>
<td>1</td>
<td>K</td>
<td>Resistance to Races 1 to 4 of Cladosporium.</td>
</tr>
<tr>
<td>Cl₁</td>
<td>13</td>
<td>R</td>
<td>Cleistogamous; flowers open slightly.</td>
</tr>
<tr>
<td>Cl₂</td>
<td>13</td>
<td>R</td>
<td>Cleistogamous; flowers open slightly.</td>
</tr>
<tr>
<td>d₁(d₁)</td>
<td>1</td>
<td>B R</td>
<td>Dwarfed plants; leaves dark and rugose.</td>
</tr>
<tr>
<td>d₁x</td>
<td>TGC 4:16</td>
<td>R</td>
<td>Extreme dwarf; recessive to d and d₁.</td>
</tr>
<tr>
<td>dl</td>
<td>1</td>
<td>B R</td>
<td>Dwarf modifier of stem length causes extreme dwarfing.</td>
</tr>
<tr>
<td>dm (d₂)</td>
<td>1</td>
<td>B Y</td>
<td>Dwarf virecent; stunted plants.</td>
</tr>
<tr>
<td>dv</td>
<td>TGC 3:23</td>
<td>R</td>
<td>Entire or broad leaflets as in Vilmorin's potato leaf.</td>
</tr>
<tr>
<td>e (b)</td>
<td>17</td>
<td>B R</td>
<td>Elongation of fruit as in Oxheart.</td>
</tr>
<tr>
<td>el (e)</td>
<td>1</td>
<td>B</td>
<td>Excelled stigmas, or styles twisted in anther tubes.</td>
</tr>
<tr>
<td>ex</td>
<td>13</td>
<td>R</td>
<td>Fasciated or many-loculed fruits as in Ponderosa.</td>
</tr>
<tr>
<td>f</td>
<td>1</td>
<td>B R</td>
<td>Fleshy calyx; sepals often curled.</td>
</tr>
<tr>
<td>f₁ (G)</td>
<td>17</td>
<td>B Y</td>
<td>Inhibits modifiers; permitting expression of G.</td>
</tr>
<tr>
<td>g</td>
<td>18</td>
<td></td>
<td>Grooved fruits; may be associated with fasciation.</td>
</tr>
<tr>
<td>gs</td>
<td>TGC 1:9</td>
<td>R</td>
<td>Green stripes in fruit epidermis, golden in ripe fruit.</td>
</tr>
<tr>
<td>H</td>
<td>1</td>
<td>B R</td>
<td>Non-hairy or smooth stems, hypocotyl and growing point hairy.</td>
</tr>
<tr>
<td>hl</td>
<td>1</td>
<td>B R</td>
<td>Hairless plants; no hairs on hypocotyl.</td>
</tr>
<tr>
<td>I</td>
<td>17</td>
<td>Y</td>
<td>Immunity to race 1 of Fusarium lycopersici.</td>
</tr>
<tr>
<td>j</td>
<td>1</td>
<td>B R</td>
<td>Jointless pedicels.</td>
</tr>
<tr>
<td>(K)</td>
<td>17</td>
<td></td>
<td>Inhibits modifiers; permitting expression of K.</td>
</tr>
<tr>
<td>l</td>
<td>1</td>
<td>B R</td>
<td>Lúteulence; yellowish unripe fruits; premature yellowing of leaves.</td>
</tr>
<tr>
<td>Lc</td>
<td>17</td>
<td>Y</td>
<td>Fruits with only 2 or 3 locules; associated with c-allele.</td>
</tr>
<tr>
<td>(l₁c₁, l₁c₂, l₁c₃)</td>
<td>10</td>
<td></td>
<td>Control locule number.</td>
</tr>
<tr>
<td>l₁f</td>
<td>1</td>
<td>B R</td>
<td>Leafy inflorescence or running flower trusses.</td>
</tr>
<tr>
<td>lg</td>
<td>TGC 4:9</td>
<td>Y B</td>
<td>Light green foliage.</td>
</tr>
<tr>
<td>m</td>
<td>1</td>
<td>B R</td>
<td>Mottled leaves and cotyledons.</td>
</tr>
<tr>
<td>m₁c</td>
<td>1</td>
<td>B R</td>
<td>Macrocalyx; sepals leaf-like.</td>
</tr>
<tr>
<td>m₁s</td>
<td>--</td>
<td>R</td>
<td>Male-sterile mutants with the following characteristics:</td>
</tr>
<tr>
<td>m₁s₁</td>
<td>11</td>
<td>R</td>
<td>Pale shrunken anthers, no pollen; hybrid stock.</td>
</tr>
<tr>
<td>m₁s₂</td>
<td>11</td>
<td>R</td>
<td>Pale shrunken anthers, no pollen; Pearson.</td>
</tr>
<tr>
<td>m₁s₃</td>
<td>11</td>
<td>R</td>
<td>Very pale shrunken anthers, collapsed pollen mother cells; San Marzano.</td>
</tr>
<tr>
<td>Gene symbol</td>
<td>Reference</td>
<td>Seed Source*</td>
<td>Character</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>ms₄</td>
<td>11</td>
<td>R</td>
<td>Pale shrunken anthers, a few aborted pollen grains; Early Santa Clara.</td>
</tr>
<tr>
<td>ms₅</td>
<td>12</td>
<td>R</td>
<td>Abnormally small flowers, very pale and greatly shrunken anthers, usually no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₆</td>
<td>12</td>
<td>R</td>
<td>Shrunken pale anthers, no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₇</td>
<td>12</td>
<td>R</td>
<td>Nearly normal-colored, slightly shrunken anthers, aborted pollen in tetrads; San Marzano.</td>
</tr>
<tr>
<td>ms₈</td>
<td>12</td>
<td>R</td>
<td>Abnormally small flowers with exserted stigmas, pale shrunken anthers, no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₉</td>
<td>12</td>
<td>R</td>
<td>Anthers nearly normal, no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₁₀</td>
<td>12</td>
<td>R</td>
<td>Abnormally small flowers, small, very pale anthers, greatly exserted stigmas, no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₁₁</td>
<td>12</td>
<td>R</td>
<td>Very pale shrunken anthers, aborted pollen free or in tetrads; San Marzano.</td>
</tr>
<tr>
<td>ms₁₂</td>
<td>12</td>
<td>R</td>
<td>Abnormally small flowers, nearly normal-colored but shrunken anthers, no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₁₃</td>
<td>12</td>
<td>R</td>
<td>Nearly normal anthers, free aborted pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₁₄</td>
<td>TGC 3:19</td>
<td>R</td>
<td>Very pale shrunken anthers, aborted pollen; Earliana.</td>
</tr>
<tr>
<td>ms₁₅</td>
<td>TGC 3:19</td>
<td>R</td>
<td>Abnormally small flowers with exserted pistils, very pale dwarfed anthers, no pollen; San Marzano.</td>
</tr>
<tr>
<td>ms₁₆</td>
<td>TGC 3:19</td>
<td>R</td>
<td>Pale shrunken anthers, clumped aborted pollen; Pritchard; discovered by O. H. Pearson.</td>
</tr>
<tr>
<td>ms₁₇</td>
<td>TGC 3:19</td>
<td>R</td>
<td>Pale shrunken anthers, no pollen; Ace.</td>
</tr>
<tr>
<td>ms₁₈</td>
<td>TGC 3:19</td>
<td>R</td>
<td>Exserted stigmas, slightly pale, very shrunken anthers, no pollen; Cal-255.</td>
</tr>
<tr>
<td>mt</td>
<td>6</td>
<td>D</td>
<td>Midget; all parts of plant reduced; high sterility.</td>
</tr>
<tr>
<td>n (nt)</td>
<td>17</td>
<td>B</td>
<td>Nipple-tips on fruits.</td>
</tr>
<tr>
<td>nc</td>
<td>1</td>
<td>B</td>
<td>Narrow cotyledons; slow growth.</td>
</tr>
<tr>
<td>ne</td>
<td>1</td>
<td>B</td>
<td>Necrotic leaf spots; slowly kill leaves.</td>
</tr>
<tr>
<td>o</td>
<td>1</td>
<td>B</td>
<td>Ovate or pear shape fruits.</td>
</tr>
<tr>
<td>(0, 0', 0)</td>
<td>18</td>
<td>Y</td>
<td>Spherical, oblate, and elongate fruits.</td>
</tr>
<tr>
<td>ol</td>
<td>2</td>
<td>Y</td>
<td>Ovate fruits with low locule-number.</td>
</tr>
<tr>
<td>p</td>
<td>1</td>
<td>B R</td>
<td>Peach or pubescent fruits.</td>
</tr>
<tr>
<td>pe</td>
<td>1</td>
<td>B Y</td>
<td>Sticky fruit epidermis.</td>
</tr>
<tr>
<td>pi</td>
<td>13</td>
<td>B Y</td>
<td>Pistillate flowers.</td>
</tr>
<tr>
<td>pr</td>
<td>TGC 4:9</td>
<td>B</td>
<td>Propeller-like cotyledons; reduced plumule.</td>
</tr>
<tr>
<td>ps (va)</td>
<td>5</td>
<td>B R</td>
<td>Positional-sterile flowers, prevents normal opening of corolla.</td>
</tr>
<tr>
<td>r</td>
<td>1</td>
<td>B R</td>
<td>Yellow flesh color.</td>
</tr>
<tr>
<td>rc</td>
<td>17</td>
<td>B R</td>
<td>Rolled cotyledons.</td>
</tr>
<tr>
<td>rl</td>
<td>17</td>
<td>B</td>
<td>Rosette, very short internodes, no flowers.</td>
</tr>
<tr>
<td>ro</td>
<td>TGC 4:9</td>
<td>B</td>
<td>Rosette, very short internodes, no flowers.</td>
</tr>
</tbody>
</table>
## LIST OF GENES

<table>
<thead>
<tr>
<th>Gene symbol</th>
<th>Reference</th>
<th>Source</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>rv</td>
<td>TGC 3:23</td>
<td>R</td>
<td>Reticulate virescent; new leaves pale with dark veins.</td>
</tr>
<tr>
<td>s</td>
<td>1</td>
<td>B R</td>
<td>Compound inflorescence; greatly increased number of flowers.</td>
</tr>
<tr>
<td>Se</td>
<td>17</td>
<td>A</td>
<td>Septoria resistance.</td>
</tr>
<tr>
<td>sl</td>
<td>TGC 3:6</td>
<td>D</td>
<td>Stamenless.</td>
</tr>
<tr>
<td>Sm</td>
<td>4</td>
<td>A</td>
<td>Stemphylium resistance.</td>
</tr>
<tr>
<td>sp</td>
<td>1</td>
<td>B R</td>
<td>Self-pruning or determinate stems. Sterile plants.</td>
</tr>
<tr>
<td>st</td>
<td>17</td>
<td>B R</td>
<td>Tangerine-orange color of flesh and stamens. Trifoliate leaf, long petiole.</td>
</tr>
<tr>
<td>tf (ct)</td>
<td>TGC 3:11 &amp; 23</td>
<td>R</td>
<td>Uniform light green color of unripe fruits; no dark shoulders.</td>
</tr>
<tr>
<td>u (u₁)</td>
<td>1</td>
<td>B R</td>
<td>Uniform green color of unripe fruits; no dark shoulders.</td>
</tr>
<tr>
<td>ug (u₂)</td>
<td>1</td>
<td>B Y</td>
<td>Virecent white seedlings.</td>
</tr>
<tr>
<td>v</td>
<td>17</td>
<td></td>
<td>Verticillium resistance.</td>
</tr>
<tr>
<td>Ve</td>
<td>15</td>
<td>D</td>
<td>Vegetative; deformed, usually functionless flowers.</td>
</tr>
<tr>
<td>vg</td>
<td>13</td>
<td>R</td>
<td>Villous, hairy stems.</td>
</tr>
<tr>
<td>vi</td>
<td>TGC 2:2</td>
<td>B</td>
<td>Wiry; slender, strap-like leaflets; dwarfed plants.</td>
</tr>
<tr>
<td>w₁</td>
<td>1</td>
<td>B</td>
<td>Wiry; like w₂, except ovary more syncarpous. Wilty dwarf plants; grayish-green, droopy leaves.</td>
</tr>
<tr>
<td>w₂</td>
<td>TGC 4:14</td>
<td>R</td>
<td>White or tan corolla.</td>
</tr>
<tr>
<td>wd</td>
<td>14</td>
<td></td>
<td>Woolly leaflets and stems.</td>
</tr>
<tr>
<td>wf</td>
<td>17</td>
<td>Y R</td>
<td>Wilty leaflets; leaf margins curl adaxially. Ineffective microgametes associated with I- allele.</td>
</tr>
<tr>
<td>Wo</td>
<td>1</td>
<td>B R</td>
<td>Xanthophylic or yellow leaves.</td>
</tr>
<tr>
<td>wt</td>
<td>1</td>
<td>B R</td>
<td>Clear, colorless skin on fruits.</td>
</tr>
<tr>
<td>x</td>
<td>17</td>
<td>Y</td>
<td>Yellow lethal seedlings.</td>
</tr>
<tr>
<td>Xa</td>
<td>1</td>
<td>B R</td>
<td>Yellow virescent; new foliage is pale yellow-green.</td>
</tr>
<tr>
<td>y</td>
<td>1</td>
<td>B R</td>
<td></td>
</tr>
<tr>
<td>ys</td>
<td>17</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>yv</td>
<td>TGC 3:23</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

### Seed Sources:
- A.-C. F. Andrus
- B.-L. Butler
- D.-Discoverer signifies he can supply stock.
- K.-E. J. Kerr
- R.-C. M. Rick
- Y.-P. A. Young

### Literature Cited

Gene List Committee

L. Butler, Chairman
D. W. Barton
P. A. Young
C. M. Rick
Butler, L. Andrus
Green stem, ag.
A green stem selection received from C. F. Andrus appeared to be identical in phenotype with green stem a. Closer examination however, showed that when growth was slowed through lack of water or because of transplanting, the underside of the cotyledons and leaves become purple. The stem remains green under all conditions. Breeding tests show that this green stem shows typical monogenic inheritance and that the gene is different from the other green stem genes ag, al, and aw. Linkage tests reveal either loose linkage or independence from tester genes in Groups I, II, IV, V, VI, VIII, and XI. With clear skin y it gives a cross-over value of 14.1 ± 4.9% which is a doubtful linkage.

Butler, L. Light green foliage, lg.
Sticky peel pe is associated with light green foliage. The variety Golden Colossus also has light green foliage. This character gives monogenic F2 segregation ratios, and breeding tests indicate that the two light green foliages are genotypically identical. The gene is in linkage group VII near H. Further tests are necessary before the gene can be placed exactly.

Butler, L. Propeller, pr.
This X-ray mutant is characterized by large persistent cotyledons which when viewed from above have a superficial resemblance to the blades of a propeller. The plumule is retarded and for the first three weeks the plants appear to be without any plumule. During this time the hypocotyl becomes elongated, then a callous formation develops in the axils of the cotyledons. This callous elongates and forms the twisted curly leaves and the distorted stems of this mutant. The plant never grows more than six inches high and the cotyledons remain a conspicuous part of its morphology and photosynthetic apparatus. The mutants usually produce one to three flower clusters but these rarely set fruit. After flowering the plants usually die. This mutant gives good monohybrid ratios and shows no linkage with testers in groups I, VII or VIII.

Butler, L. Rosette, ro.
This mutant arose in MacArthur's X-rayed stock and is characterized by extreme reduction of the internodes so that all the leaves emerge from the region just above the cotyledons. The mutant never flowers, but one or two year old plants do occasionally produce vestigial flower buds. Old plants with 50 - 100 nodes rarely reach a height of six inches as opposed to 10 - 15 feet in normal ones of similar age. Cotyledons are persistent for a long period but never become enlarged, and the hypocotyl is shortened. Axillary branching is also suppressed; the few side shoots of this mutant present an extreme contrast with the mutant bushy (bu) that arose in the same X-rayed stock. A pleiotropic effect of the ro gene is the reduced branching of the roots. Usually this mutant produces a single tap root which contrasts greatly with the mass of rootlets in normal plants of the same age. The leaflets in this mutant are narrower than in normal plants.

The mono-hybrid ratios show a deficiency of mutant types, a typical ratio being 462:105 with a chi square of 12.7. Rosette is in linkage group I being linked with dwarf with a cross-over value of 20.9% as shown by the dihybrid ratio ++ 782: +d 342; ro + 235; d ro 11.
A method has been developed which predicts relative paste consistency of tomato breeding lines by measuring the viscosity of unconcentrated pulp. A gross viscosity measurement was decided advantageous only after failure of the following partial measures or their combinations: visual selection for "dryness", soluble and insoluble pectic substances, total dry matter, insoluble solids, and serum viscosity.

In preparing samples, any method of preservation is suitable which rapidly (in seconds) inactivates pectic enzymes of freshly broken fruit or which utilizes unbroken fruit. Where a few samples are required for immediate analysis, we slice a known weight of fruit into boiling distilled water, maintain the temperature of the mixture above 190°F, and then bring back to the original weight. For large numbers of samples, 20 oz. of fruit are placed whole in #2½ cans, put in an exhaust box at 212°F. for 30 minutes, sealed, and cooked for 30 minutes. Large fruits are halved or quartered with a sharp knife and quickly put into the steam in the latter method. Water condenses and dilutes the samples, but this is usually a constant factor. Either method gives evidence of slight pectic degradation and a better preservation technique is being sought.

The enzyme-inactivated samples are juiced in an R.Y.P. "Healthmaster" food juicer. Here, tomatoes are forced down a short cylinder in the top of the machine onto the toothed bottom of a perforated basket turning at 7000 rpm. The basket is fabricated from a flat piece of 20-mesh stainless steel screen. Seeds and skin are thrown off at the top and pulp passes thru the perforations. Air whipped into the juice can be removed by mechanically stirring under vacuum for 5 to 15 minutes.

The gross viscosity of the deaerated juice is measured by timing the flow of a constant volume (19.5 ml), under constant pressure (20 cm of HgO), at 77°F. through a 2 mm capillary tube 90 cm long. Time in seconds can be used as a satisfactory measurement for comparative purposes or the "apparent viscosity" in centipoise (cp) can be calculated from the following formula:

\[
\text{Tomato Juice (cp)} = 60\% \text{ sucrose (cp)} \times \frac{\text{sp. grav. tomato Juice}}{\text{sp. grav. 60\% sucrose}} \times \frac{\text{time for tomato juice}}{\text{time for 60\% sucrose}}
\]

Different readings on the same well-mixed juice vary only 0-5% from the average reading; duplicates from the same samples show no significant differences. Paste consistency, as measured by the Bostwick flow test, of 8 different "lines" showed a good relationship to unconcentrated juice viscosity as measured by the capillary tube.

Fryxell, P. A. Genetics of locule number. A major effect locus (Lc-Lc+) exists in linkage group I concerned with the number of locules in the fruit. Since varieties are known having a wide range of mean locule number, a single locus with two alleles is not a complete account of the genetic basis of locule number. Two possibilities exist: (1) a series of multiple alleles exists at the Lc locus, or (2) differences in the modifier background exist, i.e., other loci are concerned with the trait. An experiment was designed to test the possibility of a multiple allele series. Evidence was at hand indicative of a single gene segregation for locule number between the varieties Devon (modal value, three) and Pan American (modal value, about five). A third variety, Goldball (two-loculed), was considered for testing the possibility of a third allele determining the third phenotype. Gold Ball, Pan American, the hybrid, and the backcross to Pan American were studied. A one to one segregation pattern would be expected.
from the backcross generation and none was observed. Segregation was noted considerably beyond the recurrent parent for mean locule number. Thus, no evidence was found for the existence of a multiple allele series.

An additional item of interest, determined from other crosses, indicates that the two-loculed phenotype of the variety Gold Ball has a different genetic base from that of other material (e.g., L. pimpinellifolium). Hybrids involving Gold Ball crossed with parents with higher locule number show an intermediate phenotype, rather than the usual dominance of the two-loculed parent.

Fryxell, P. A. The relationship between locule number and fruit weight. Correlations have been observed previously between locule number and fruit weight. However, a phenotypic correlation can be quite misleading in interpreting genetic phenomena. Therefore, consideration was given to genetic correlations obtained from the genetic components of variance and covariance. Such a correlation could be contributed to from two causal sources, viz., linkage and/or pleiotropy.

The genetic correlation between these two traits was measured in two populations. One was a segregating (backcross) population, the other a non-segregating population of the F1-F2 type of experimental set-up (Griffing, Genetics 35: 303-321, 1950). The latter involved six strains and all possible hybrids. (The strains involved were Red Currant, Gold Ball, Devon, Sterling Castle, Matchless, and Pan American.) In the non-segregating population, the genetic correlation observed would not be expected to involve any contribution due to linkage, if we can assume that the six strains involved are a random sample of all possible genotypes for these two traits. The magnitude of this correlation would be due solely to pleiotropic gene action. In the segregating material, on the other hand, both pleiotropy and linkage would contribute to the magnitude of the genetic correlation. Thus, a comparison of the two correlations should permit an evaluation of the relative magnitudes of linkage and pleiotropy as contributory causes.

The genetic correlations observed were (on the basis of logarithmic data):

- segregating population: \( r_G = 0.69 \pm 0.07 \)
- non-segregating population: \( r_G = 0.69 \).

Thus, we may conclude that the genetic correlation of approximately 0.7 is the result of pleiotropy; that is, the two traits have genes in common.

It should be noted, parenthetically, that a difficulty exists in precisely defining pleiotropy as a distinct entity from exceedingly close linkage (Mather, 1949).

A knowledge of the source and magnitude of such a correlation is of value in practical breeding work, where the two traits concerned are of interest. We know beforehand, e.g., that attempts to recombine the traits will not be very successful in that recombination due to crossing-over of linked genes will not be expected to occur. Conversely, if the traits are both desired, selection for one of them will suffice, as it will automatically tend to select for the other, thus saving expenditure of effort.

Fryxell, P. A. Quantitative characters in a tomato cross, as affected by genotype and environment. Two strains of tomatoes and their reciprocal hybrids were grown in a greenhouse experiment involving five treatments. The strains were L. esculentum cerasiforme, originally collected in Mexico (designated 9), and a L. esculentum strain from Manchuria (designated 8). Both were obtained from the collection of the late E. W. Lindstrom; both are small (cherry) fruited varieties. The treatments were five levels of moisture ranging from treatment 1, a bare survival level, to treatment 5, a virtual constant saturation.

The material was grown as a factorial experiment with five replications,
there being one hundred plants in the experiment. Data were collected on a number of characters and an analysis of variance made for each. Table 1 presents the results of these analyses for ten characters, presented as the significance level shown for each source of variation. Table 2 presents the genotype and treatment means for each of these characters, together with the standard deviation associated with each trait.

### Table 1

<table>
<thead>
<tr>
<th>Trait</th>
<th>Reps</th>
<th>Treatments</th>
<th>Var.</th>
<th>Rec.</th>
<th>Parents</th>
<th>I vs H</th>
<th>Trt. x Var.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dry weight</td>
<td>+</td>
<td>+++</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Shoot weight</td>
<td>++</td>
<td>+++</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Root weight</td>
<td>n.s.</td>
<td>+++</td>
<td>+++</td>
<td>n.s.</td>
<td>++</td>
<td>++</td>
<td>n.s.</td>
</tr>
<tr>
<td>Root/shoot ratio</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>n.s.</td>
<td>+++</td>
<td>++</td>
<td>n.s.</td>
</tr>
<tr>
<td>Indentation</td>
<td>n.s.</td>
<td>+++</td>
<td>n.s.</td>
<td>n.s.</td>
<td>+</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Shape</td>
<td>n.s.</td>
<td>n.s.</td>
<td>+++</td>
<td>n.s.</td>
<td>+++</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Shape 3</td>
<td>n.s.</td>
<td>n.s.</td>
<td>+++</td>
<td>n.s.</td>
<td>+++</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Minimum width</td>
<td>n.s.</td>
<td>++</td>
<td>+++</td>
<td>n.s.</td>
<td>+++</td>
<td>+</td>
<td>n.s.</td>
</tr>
<tr>
<td>Maximum width</td>
<td>n.s.</td>
<td>+++</td>
<td>+++</td>
<td>n.s.</td>
<td>+++</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Length of terminal leaflet</td>
<td>+</td>
<td>+++</td>
<td>+</td>
<td>n.s.</td>
<td>++</td>
<td>++</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Table 1. n.s.: not significant; +: significant at 5% level; ++: significant at 1% level; +++: significant at .1% level. Traits 5 through 10 are concerned with measurements of the terminal leaflet of the first fully expanded leaf.

1. Measured as difference between maximum and minimum width.
2. Measured as ratio of length to minimum width.
3. Measured as ratio of length to maximum width.
<table>
<thead>
<tr>
<th>Trait</th>
<th>Genotypes</th>
<th>Treatments</th>
<th>stand. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>8</td>
<td>9x8</td>
</tr>
<tr>
<td>1. Total dry weight</td>
<td>4.86</td>
<td>4.74</td>
<td>4.87</td>
</tr>
<tr>
<td>2. Shoot weight</td>
<td>3.74</td>
<td>3.85</td>
<td>3.76</td>
</tr>
<tr>
<td>3. Root weight</td>
<td>1.12</td>
<td>0.90</td>
<td>1.11</td>
</tr>
<tr>
<td>4. Root/shoot ratio</td>
<td>0.29</td>
<td>0.23</td>
<td>0.28</td>
</tr>
<tr>
<td>5. Indentation</td>
<td>11.88</td>
<td>14.00</td>
<td>12.64</td>
</tr>
<tr>
<td>6. Shape 1/min. w.</td>
<td>4.38</td>
<td>3.02</td>
<td>3.43</td>
</tr>
<tr>
<td>7. Shape 1/max. w.</td>
<td>2.25</td>
<td>1.79</td>
<td>2.00</td>
</tr>
<tr>
<td>8. Minimum width</td>
<td>12.32</td>
<td>18.60</td>
<td>17.04</td>
</tr>
<tr>
<td>9. Maximum width</td>
<td>24.20</td>
<td>32.60</td>
<td>29.84</td>
</tr>
<tr>
<td>10. Length of terminal leaflet</td>
<td>105.68</td>
<td>113.56</td>
<td>116.20</td>
</tr>
</tbody>
</table>

Table 2. Traits 1, 2, and 3 given in grams; traits 8, 9, and 10 given in millimeters. Genotype and treatment means.
The three degrees of freedom for "varieties" were broken down into three orthogonal components for "reciprocal hybrids", "parental lines", and "inbreds vs. hybrids", respectively. The mean square corresponding to the single degree of freedom for testing the difference between reciprocal hybrids was non-significant for all traits. In one case (indentation) the hybrids diverged in the direction of their maternal parents. The difference was not significant (p=0.5), but it is mentioned in the light of the difference between reciprocal hybrids noted by Schröder (Z.I.A.V. 69: 159-192. 1935) for leaf shape. It is considered worthy of further study.

The mean square for "inbreds vs. hybrids" provided a test for the deviation of the hybrids from the mid-parental value (for the scale of measurement used). It will be noted that for the majority of traits the hybrids did not differ significantly from the mid-parental value. Thus, dominance was lacking, inheritance was intermediate for these traits.

Of the traits exhibiting dominance, one (length) showed evidence of heterosis, i.e., the hybrids lay outside the parental range. The three degrees of freedom in this case were broken down into a set of orthogonal comparisons such that one degree of freedom was available to test the difference of the hybrids from the high parent. This difference was not significant.

For two of the traits, total weight and shoot weight (actually a single trait is involved) no parental differences were found. In no case did the treatment-variety interaction show significance.

Lesley, J. W. Delayed occurrence of a mutation resembling "wiry" from X-rayed seeds.

Seeds of the third inbred generation of the very fruitful variety, First Early, were exposed to X-rays. Eighty-one seeds previously kept on moist filter paper at 27°C. received a dose of about 10,000 r. at 300 r. per minute. Fifty plants from treated seeds were transplanted to the field of which 46 reached maturity. Thirty-six were normal in fruitfulness and 5 were distinctly less fruitful and 5 had only 5 fruits or less. One plant was a chimera having a component with abnormally narrow leaves. Seed was planted from several R1 plants including 52.162.7. This plant was unhealthy but recovered. Its pollen varied in amount but when examined in I-KI solution contained about 75 per cent normal-looking grains and seed production was about normal. R2, obtained by selfing, contained 8 seedlings which were very fruitful including one 52.112.13 that seemed unusually early ripening, and 3 similar mutants determinate in growth. One of the mutants produced no fruit, another produced a few small fruits very late in the season and the third died of curly top. No difference from the normal in leaf or flower was observed.

The R3 generation from the early fruitful plant 52.112.13 selfed contained 59 normal, 24 mutants and 7 undetermined. This mutant (w2) was different from the determinate mutant that occurred in R2 and closely resembled the "wiry" mutant described by Lesley and Lesley (Jour. Hered. 19, 1928) and by Schiemann (Z.I.A.V. 63, 1933). The ovary, however, seemed more often syncarpous. The mutation presumably was caused by the X-rays but if so, why did not the mutant appear in the immediate progeny of the X-rayed seed? Apparently the mutation occurred in 2 stages. An ingenious explanation, supplied by Dr. T. M. Little, University of California, Riverside, is that the mutation to w2 occurred only in some cells of the treated seed which developed into the R1 plant 52.162.7. Thus, it was a chimera and either the eggs or the pollen were derived from mutated cells, not both. Hence, its progeny, R2 family 52.112, were either heterozygous for the mutation or did not contain it. A heterozygous R2 plant 52.112.13 selfed gave in R3 a mono-hybrid ratio for the recessive mutation resembling wiry.
The possible relation of the R3 mutant to the determinate mutant that occurred in R2 should be studied.

Lesley, M. M. Sterility caused by loss of the nuclear wall in early prophase of L. peruvianum.

A very vigorous plant from an open-pollinated line of L. peruvianum PI 126, 916 (48.074.1) has pale yellow flowers which usually fail to open fully. No normal pollen is produced. In pre-leptotene or zygotene the nuclear wall in the PMC breaks and masses of Feulgen-positive material appear suddenly in its place, together with a few fibers. The number of these masses varies from one to many; usually there are from 3-7 which vary greatly in size and shape. A more or less normal spindle may be formed and cell division occurs, giving a majority of dyads but also triads, tetrads, and polyads. In late October of 1950 occasional cells were found to have 24 unpaired chromosomes. Embryo sac mother cells taken at the same time had 24 single chromosomes scattered upon the spindle. More flowers tend to open fully late in the growing season. Sibs of 48.074.1 had flowers which opened normally. Meiosis was normal and the plants were very fruitful.

The behavior of D.N.A. in 48.074.1 indicates that it is in a semifluid condition in early prophase.

Manunta, C. Physiogenetic researches on the crosses between races of L. esculentum. (submitted by C. Jucci)

Physiogenetic researches on the crosses L. hirsutum x L. esculentum (var. Palla Oro, Comet, Cuor di Bue) confirm the results already emerged from researches on F2 and F3:

1) No correlation between vitamin C content and carotenoid content in fruit.
2) The gene A, responsible for the B-carotene synthesis, is not present in common red-fleshed and yellow fleshed varieties. Such conclusion has been confirmed by the results obtained by Tomes, Quackenbush, Nelson and North on their
crosses between yellow, red-orange, and tangerine varieties.

3) In F4 a full range of phenotypes occurs: high lycopen and low carotene content, high carotene and lycopen traces, equal content of both pigments, red orange fruits with high content of both. The synthesis of the two pigments is made through distinct processes, controlled by two independent genic systems. This conclusion is confirmed both by my researches on the effect of high temperature on maturation, and by the recent studies of Goodwin and Malini Janikorn.

4) Very important for selection is the occurrence of phenotypes having high content in provitamin A and in vitamin C - equal at least to that of common cultivated varieties - and in lycopen (mg. % B-carotene > 7.05-8.15; lycopen 16.70-1550; ascorbic acid 35).

Rick, C. M. An anomalous accession of L. pimpinellifolium from the Galapagos Islands.

Seeds were obtained from a correspondent on Indefatigable Island of a wild tomato purported to be L. Cheesemanii. After experiencing a great deal of difficulty, it was finally possible to germinate a few seeds after scarification. The plants thereby produced do not correspond to either L. Cheesemanii or L. C. f. minor as ascertained by comparison with herbarium sheets, but to a form of L. pimpinellifolium previously collected on the same island. Although closest to the latter species it differs from it in the following respects: (1) production of a few large trichomes; (2) pale color of foliage; (3) heavy anthocyanin pigmentation of nodes and flower buds; (4) dull yellowish flesh color; (5) smaller size of parts, particularly seeds; (6) poor growth and very low fruit set under California field conditions. In respect to the last characteristic, the plant seems to be well adapted to the cool moist conditions of the winter greenhouse, which apparently approximates those of the fog belt in which it was found.

In tests of its crossing relations, this accession shows complete compatibility with L. esculentum and L. pimpinellifolium and no more affinities with the rest of the genus than either of these species shows. F1 hybrids with these two species are completely fertile. All available morphological and genetic information therefore indicates that this collection belongs in the red-fruited group, and, since it bears closer resemblance to L. pimpinellifolium it is provisionally classified in that species.

In cultures here it has developed symptoms of tobacco mosaic, but its reaction to tomato diseases in general has not been tested. Seeds are available for exchange.

Rick, C. M. Extreme dwarf; a new allele at the d locus.

Extremely stunted seedlings appeared in plantings of PI 188, 565, an Italian variety named San Pancrazio R-15. These seedlings are distinguished from those of all other mutants that I know by their very short hypocotyls, and short, dark, and strongly recurved cotyledons. Growth is very slow, the plants reaching a height of not more than 15-18 inches in an entire year of culture in the greenhouse. All parts of the mature plant are greatly reduced in size and most organs are modified in the direction of shorter and broader shapes. Leaves are very dark green, the surface bullate, and the midrib twisted. Despite these abnormalities and the great modification of flowers, viability and fertility are good. Undisturbed plants in the field survive with normal care and set numerous fruits with seeds during the course of a season.

In F1 hybrids this character behaves as if completely recessive to normal and to d. The segregation in F2 is respectively 3 normal: 1 extreme dwarf and
3 dwarf: 3 extreme dwarf, a typical observed ratio for the latter being 395 dwarf: 124 extreme dwarf. Since only two stature phenotypes have appeared in the segregating generations of any of these crosses, it follows that this new character represents an allele of \( d \), to which the symbol \( d^x \) is given.

Up to the present time over 25,000 seedlings of \( d^d \times d^x \) hybrids have been grown without the appearance of a single \( d^+ \) seedling, thereby not yielding any evidence of unequal crossing-over.

Rick, C. M. and D. W. Barton Genetic identification of chromosome 1.

Genetic trisomic tests for chromosome 1 have given significant segregations for \( y \), the ratios being 59:7\( y \) in \( F_2 \) and 72:29\( y \) in BC, the heterozygous parent in each case having had a single dose of \( y \). It is surprising that such a long chromosome did not turn up with a correspondingly long linkage group as in the case of chromosome 2. The relatively long linkage group \( V \) must belong to a much shorter chromosome.

A manuscript summarizing all of our trisomic work to date has been submitted for publication.

Robinson, R. W. and C. M. Rick Additional linkage data concerning \( rv \), \( yv \), \( dv \), \( tf \), and \( dl \).

To date the only indication of linkage observed has been between \( rv \) and \( e \). The \( F_2 \) is small and the linkage \( X^2 \) is not significant. The deviation is relatively large, however, suggesting a \( c_o \) value of about 32 units. Additional progenies will be planted shortly to permit a more reliable test for linkage.

\( yv \). No associations have been detected thus far except in an \( F_2 \) segregating in repulsion for \( yv \) and \( wt \). The data are incomplete because it was necessary to rogue the population to \( yv \) seedlings. Of 17 \( yv \) seedlings thus obtained only 3 were \( wt \). Square-root analysis of the recombination class gives, as a very rough approximation, a linkage intensity of 24\%. This relationship obviously needs a more extensive test.

\( dv \). Additional data confirm that \( dv \) is in chromosome linkage group 2(I). According to a three-point \( F_2 \), the positions are \( dv - 6 - m - 1 - d \) with about 9 units between \( dv \) and \( d \). Since \( d \) and \( m \) were coupled against \( dv \) the figures for \( d-m \) are more reliable than for the other two combinations. These estimates plus the fact that no \( dv - m - + \) individuals, part of which would represent a double crossover class, were encountered in an \( F_2 \) of 1654, suggest that the above order is correct.

\( tf \). Crosses made by both Dr. Dennett and us prove that \( tf \) and \( ct \) are allelic if not identical genes. Since \( tf \) was the symbol first applied (and is more appropriate anyway), we are proposing it for this mutant. The linkage we reported last year between \( tf \) and \( wilty \) was confirmed this year, but it turns out that the wiltyness is not conditioned by \( wt \) but by some other gene present in the \( tf \) stock. In this new wilty material the leaves curl abaxially instead of adaxially as in the case of \( wt \). According to a small coupling \( F_2 \) the linkage intensity between \( tf \) and the new wilty is about 13\%.

\( dl \). The linkage between \( dl \) and \( l \) reported last year prompted us to try \( dl \) against \( bu \). Result: rather tight linkage with a \( c_o \) value of about 9\%. In addition, \( F_2 \) data give a hint of linkage (not significant) between \( dl \) and \( al \) of about 40 units. For \( dl - l \) all data so far yield a value of 38 units. According to all known tests \( l \) and \( al \) are independent. The loci on 8(VI & VIII) are then presumably \( l = 30 - bu - 9 - dl - 40 - al \).
Sawant, A. C. Complementary semilethal factors in hybrids of L. esculentum x L. hirsutum v. glabratum. (part of a Ph.D. thesis)

All 43 F₁ plants of this hybrid show a peculiar withering. After satisfactory growth the tips of branches become pale, droop, the withering continuing toward the base until the entire branch dies. New shoots are produced, however, before the branches are completely dead. Ordinarily plants do not die under greenhouse conditions, but under field conditions, cuttings taken from greenhouse cultures grow to some extent and then die.

The backcross of this hybrid to L. esculentum as a female parent segregates 1 withered: 1 normal, and in the F₂ the ratio is 9 withered: 1 normal, suggesting complementary gene action of dominant genes derived from each species, providing an efficient isolation barrier.


Crossing of tetraploid L. esculentum (Pearson) by L. peruviamum (P.I. 129149) produced 10 plants. Each plant had 36 chromosomes. At the time of extraction of the seed from the ripe fruit the endosperm was not firm and all embryos were extracted and grown on sterile nutrient agar. The mature plants were extremely vigorous and exceedingly sterile under field conditions at Riverside. Repeated selfing produced no fruit. Crossing with diploid and tetraploid L. esculentum pollen produced no fruit. Nine seedless fruit were set with triploid L. esculentum pollen. One plant showing Curly Top symptoms produced 36 fruit from open pollination. These fruit contained 17 "normal" seeds with firm endosperm. Five plants germinated. 17 fruit were obtained from two other plants. These 17 fruit contained 22 "normal" seeds. Eight seeds germinated. Chromosome counts of these plants have not been made.

Young, P. A. Purple tops on green tomato fruits.

Purple stripes are common on the ripening fruits of Lycopersicon peruviamum. It was interesting to notice large prominent purple to black areas or smudges on the stem ends of many of the green fruits of hybrid tomatoes in which L. peruviamum was one ancestor. This character was most prominent in G1367C in November 1953. This is the F₃ of Stokesdale X G1219. The G1219 has the same ancestry as G1393 described for the green-jelly character (T.G.C. 2: 12, 1952). The green fruits of G1367C, 1 to 2 inches in diameter, showed prominent purpling of the epidermis on about 1/3 of the upper part of the fruit near the stem end. The epidermis was green under the calyx, and only the fruits that had been exposed to much sunshine showed the prominent purpling. The purpling became conspicuous only after the weather became cool to cold in the field of fall tomatoes. Perhaps purpling was associated with decreased growth.

Young, P. A. Unusual characters of Pearson tomatoes in East Texas.

Compared with Rutgers, Pearson tomato seedlings had darker green leaves. The green-wrap fruits showed strong resistance to cracking and catfacing. These are three valuable qualities. Large green fruits commonly were distinctly mottled with light green blotches about 1/2 inch wide which aided identification of the variety. The mottling disappeared when the fruits ripened.

Pearson is about 10 days later than Rutgers in maturing its fruits. Many or
most of the early large fruits had elongated blossom ends like Oxheart in which the elongation is due to the el-allele (lemons often have such appearance). Many of the green tomato fruits larger than $\frac{1}{2}$ inch in diameter on the top branches had prominent rounded knobs or pointed ends suggesting nipple tip that is due to the n-allele or the bk-allele in tomato selections of different ancestry. The F2 descendents of crosses with Pearson showed nipple tips on many of the little fruits on most of the plants indicating possible dominance of this nipple-tip tendency. However, segregation was not clear enough to determine percentages. The parent of an F3 population was chosen for freedom from nipple tip (G1478C). Nipple tips were found on some little fruits on 2% of the plants. Probably they were not due to the n-allele, as in other seasons, Pritchard and Marglobe tomatoes also have produced occasional little fruits with similar nipple tips. F1 plants of a Pearson cross showed few nipple tips when grown in cool fall weather.

A commercial crop of Pearson tomatoes in July 1951 bore normal-shaped fruits except that many of them had prominent persistent styles like bristles $\frac{1}{2}$ to $\frac{3}{4}$ inch long on their blossom ends. Descendants of these fruits produced many fruits with beaks and persistent styles.

Many tomato hybrid selections from T667 and T1294 showed nipple tips on one or more fruits per plant (usually the late fruits). Much work to free them from nipple tip was unsuccessful so they were discarded despite their valuable qualities. Only a few hybrids had nipple tips on most of their fruits.

Available evidence does not indicate the genetic nature of lemon tips, nipple tips and beaks on Pearson tomato fruits. They are rare in California. Probably modifier genes and environmental factors affecting expressivity complicate the study of nipple tip and selection work to eliminate it.

Young, F. A. Yellow lethal tomato seedlings from partly albino plants. A Bonny Best (G1187) tomato plant had some white leaflets and some gray-green leaflets with white margins. Seeds from this plant produced nearly 100 seedlings all of which had yellow cotyledons that did not turn green, so the seedlings died. The symptom resembled that described for the radium-induced, lethal ys-allele. Similarly, seeds were saved from two branches with white or yellow areas in their leaflets on a Lakeland (G1396) tomato plant the other branches of which were normally green. The resulting seedlings were yellow and died when they were about $\frac{1}{2}$ inch tall. A third case behaved differently. An F2 plant of G1417 (Southland x L. e. cerasiforme) produced a yellow-leaf branch on one plant; its other branches looked normal. Seeds from this branch produced 75 seedlings with normal green leaves and 126 plants with yellow leaves (G1573). The yellow-leaf plants all died without growing taller than 2 inches. The green-leaf seedlings were set in a field where all of them produced normal green plants. This yellow-leaf mutation apparently is due to a chromosome deficiency that makes impossible the production of chlorophyll. It occurred in 3 tomato plants that appeared to be normal except for 1 to 3 branches with albino leaves. Although a method of proof is unavailable, it is convenient to ascribe this kind of albino mutation to the ys-allele. Thus, the ys+-allele is expressed as normal ability to produce chlorophyll. The ys-allele or one similar to it appears occasionally as a recurrent mutation.
PART II

DIRECTORY OF MEMBERS

Alexander, L. J., Dept. of Botany and Plant Pathology,
Agricultural Experiment Station, Wooster, Ohio
Alvarez, Eduardo, Department of Vegetable Crops,
University of California, Davis, California
Anderson, Edgar, Missouri Botanical Garden,
2315 Tower Grove Avenue, St. Louis 10, Missouri
Andes, J. C., Agriculture Experiment Station,
University of Tennessee, Knoxville, Tennessee
Andrew, W. T., Department of Vegetable Crops,
Southern Illinois University, Carbondale, Illinois
Andrus, C. F., U.S. Regional Vegetable Breeding Laboratory,
Box 177 St. Andrews Branch P. O., Charleston, South Carolina
Ar-Rushdi, A., Department of Zoology,
University of Baghdad, Baghdad, Iraq
Barham, W. S., Department of Horticulture,
N. C. State College, Raleigh, North Carolina
Barton, D. W., Division of Vegetable Crops,
Agric. Expt. Station, Geneva, New York
Beadle, G. W., Division of Biology,
Calif. Inst. of Technology, Pasadena, California
Bessey, Paul M., Department of Horticulture,
University of Maine, Orono, Maine
Bishop, Charles J., Department of Agriculture,
Experimental Station, Kentville, Nova Scotia
Bjärlykke, Berghild, Library,
Agricultural College of Norway, Vollebekk, Norway
Bohn, G. W., Torrey Pines Hort. Field Station,
La Jolla, California
Boswell, V. R., Plant Industry Station,
Beltsville, Maryland
Bowers, J. L., Department of Horticulture and Forestry,
University of Arkansas, Fayetteville, Arkansas
Brown, Ralph T., Plaquemines Parish Expt. Station,
Diamond, Louisiana
Brown, S. W., Division of Genetics,
University of California, Berkeley L, California
Brown, Walter N., Department of Horticulture,
University of Illinois, Urbana, Illinois
Bullard, S. T., Branch Experiment Station,
University of Idaho, Parma, Idaho
Burdick, Alan, Department of Biological Sciences,
Purdue University, Lafayette, Indiana
Burnett, John H., University Department of Botany,
S. Parks Road, Oxford, England
Butler, L., Department of Zoology,
University of Toronto, Toronto S, Canada
University of California
Genetics Division, Berkeley L, California
Cannon, C. S., Department of Horticulture, Utah State Agricultural College, Logan, Utah
Casseres, E. H., InterAmerican Institute of Agric. Sciences, Turrialba, Costa Rica
Castronovo, Alfonso, Department of Plant Pathology and Botany, University of Minnesota, St. Paul, Minnesota
Chanasyk, Victor, Department of Agriculture, Experimental Station, Beaverlodge, Alberta, Canada
Condit, Alson, W. Atlee Burpee Company, Santa Paula, California
Costa, A. S., Instituto Agronomico, Campinas, Est. S. Paulo, Brazil, S. A.
Couto, Flavio A. A., Escola Superior de Agricultura, Universidade Rural, Vicosa, Minas Gerais, Brazil, S. A.
Currenec, T. M., Division of Horticulture, University of Minnesota, St. Paul, Minnesota
Dempsey, Wesley, Department of Vegetable Crops, University of California, Davis, California
Dentby, Lyall, Experimental Station, Summerland Co., British Columbia, Canada
Dennett, R. K., Bodger Seeds Ltd., El Monte, California
Downes, J. D., Jr., Department of Horticulture, Michigan State College, East Lansing, Michigan
Elle, George O., Department of Horticulture, Texas Technical College, Lubbock, Texas
Emmett, E. M., Department of Horticulture, Agricultural Experiment Station, Lexington, Kentucky
Epps, W. M., Truck Experiment Station, P. O. Box 158, St. Andrews Branch, Charleston, South Carolina
Everett, H. L., Department of Plant Breeding, Cornell University, Ithaca, New York
Flory, Walter S., Jr., Blandy Experimental Farm, Boyce, Virginia
Fogle, Harold W., Irrigation Expt. Station, State College of Washington, Prosser, Washington
Francis, F. J., Department of Horticulture, Ontario Agricultural College, Guelph, Canada
Frazier, W. A., Department of Vegetable Crops, Oregon State College, Corvallis, Oregon
Fryxell, Paul A., Department of Agronomy, New Mexico College, State College, New Mexico
Gabelman, W. H., Department of Horticulture, University of Wisconsin, Madison, Wisconsin
Gallagly, W. E., Department of Plant Pathology & Bacteriology West Virginia University, Morgantown, West Virginia
Garber, E. D., Department of Botany, University of Chicago, Chicago 37, Illinois
Gilbert, J. C., Department of Vegetable Crops, Agricultural Experiment Station, Honolulu, T. H.
Gottschalk, Werner, Max Planck- Institut fur Zuchtforschung Gut Nehof, Post Leihgestern, Kreis Giessen/Lahn, Germany
Graham, K. M., Division of Botany and Plant Pathology, Department of Agriculture, Ottawa, Canada
Griffing, J. B., Department of Genetics, Iowa State College, Ames, Iowa
Griffiths, Francis P., Fruit and Vegetable Products Lab.,
    U. S. D. A. Box 388, Weslaco, Texas
Hafen, Leslie, Department of Horticulture,
    Purdue University, Lafayette, Indiana
Hardin, K., Geary, Oklahoma
Hargrave, P. D., Provincial Horticultural Station,
    Brooks, Alberta, Canada
Harrison, A. L., Plant Disease Lab., Rt. 3, Yoakum, Texas
Helsel, Paul E., Associated Seed Growers, Inc.,
    Franklin, Indiana
Holmes, F. O., Rockefeller Institute,
    66th Street and York Avenue, New York 21, New York
Honma, Shigemi, Department of Horticulture,
    University of Nebraska, Lincoln 9, Nebraska
Hornby, C. A., Department of Horticulture,
    University of British Columbia, Vancouver, Canada
Horowitz, Ingo. Solomon, Catedra de Genetica,
    Facultad de Ing. Agronomia, Maracay, Venezuela
Huaelsen, W. A., Department of Horticulture,
    University of Illinois, Urbana, Illinois
Huskins, C. L., Department of Botany,
    University of Wisconsin, Madison, Wisconsin; (deceased)
Isbit, Arthur, Michigan State College, East Lansing, Michigan
Jacoby, Daniel, 383 Andrews Road, East Julliston, L. I., N. Y.
Jenkins, J. A., Division of Genetics,
    University of California, Berkeley 4, California
John, C. A., H. J. Heinz Company, Bowling Green, Ohio
Johnstone, F. E., Jr., Department of Horticulture,
    University of Georgia, Athens, Georgia
Joubert, T. G., Pretoria Hor. Res. Station,
    P. O. Box 994, Pretoria, Union of South Africa
Jucci, Carlo, Centro Di Genetica,
    Istituto Di Zoologia, Universita Pavia, Pavia, Italy
Kemp, G. A., Experimental Station
    Department of Agriculture, Lethbridge, Alberta, Canada
Kerr, E. A., Horticulture Experimental Station,
    Vineland, Ontario, Canada
Kihara, H., Laboratory of Genetics, Department of Agriculture,
    Kyoto Imperial University, Kyoto, Japan
Kristensen, Reinh, Horticultural Plant Breeding Station,
    Toftoe, Taastrup, Denmark
Kurki, Lea, Horticulturists Association,
    Hallituskutu 11, Helsinki, Finland
Lamm, Robert, Statens Trädgårdsförk., Älnarp, Akarp, Sweden
Larson, R. E., Department of Horticulture,
    Pennsylvania State College, State College, Pennsylvania
Lesley, J. W., Division of Plant Breeding,
    Citrus Experiment Station, Riverside, California
Lesley, Margaret M., Citrus Experiment Station,
    University of California, Riverside, California
Lewis, D., John Innes Horticultural Inst.
    Bayfordbury, Hertfordshire, England
Locke, L. F., S. Great Plains Field Station, Woodward, Oklahoma
Lorenz, Laverne, Isabella, Oklahoma
Lyall, L. E., Department of Agriculture,
    Central Experimental Farm, Ottawa, Canada
Macfarland, C. S., Jr., American Tomato Yearbook,  
Big Scotch Plains Avenue, Westfield, New Jersey

McGuire, D. C., Department of Vegetable Crops,  
Agricultural Expt. Station, Honolulu 14, T. H.

Mai, W. F., Department of Plant Pathology,  
Cornell University, Ithaca, New York

Mariota-Trias, F., Agricultural Experiment Station,  
University of Puerto Rico, Rio Piedras, Puerto Rico

Martens, Thomas R., Department Biological Science,  
Purdue University, Lafayette, Indiana

Mikell, J. J., Department of Horticulture,  
Agricultural Experiment Station, Baton Rouge, Louisiana

Mishanec, William, Division of Vegetable Crops,  
Agricultural Experiment Station, Geneva, New York

Mohamed, Mohamed Abdel Maksoud, Faculty of Agriculture,  
University of Ibrahim, Shebin El-Kom, Egypt

Mohr, H. C., Department of Horticulture,  
Agricultural Experiment Station, College Station, Texas

Morrison, Gordon, Burgess Seed & Plant Company,  
Galesburg, Michigan

Munger, H. M., Department of Plant Breeding,  
Cornell University, Ithaca, New York

National Institute of Genetics, Yeta III, Misima, Japan

Nonnbeck, I. L., Experimental Station,  
Lethbridge Com., Alberta, Canada

Odland, M. L., Department of Horticulture,  
Pennsylvania State College, State College, Pennsylvania

Orton, Jr., E. R., Department of Horticulture,  
Ohio State University, Columbus, Ohio

Ounsworth, L. W., Experimental Station, Harrow, Ontario, Canada

Paddock, Elton F., Department of Botany,  
Ohio State University, Columbus, Ohio

Pearson, O. H., Eastern States Farmers Exchange,  
West Springfield, Mass.

Perry, B. A., Texas Agricultural Experiment Station,  
Substation 19, Winter Haven, Texas

Peto, Howard B., Peto Seed Company,  
P.O. Box 3065, 1056 1/2 E. Front St., Ventura, California

Praelst, R. L., Department of Horticulture,  
Iowa State College, Ames, Iowa

Pollack, B. L., Department of Horticulture,  
Pennsylvania State College, State College, Pennsylvania

Poola, G. F., Department of Vegetable Crops,  
Agricultural Experiment Station, Honolulu, Hawaii

Powers, L., Horticultural Field Station, Cheyenne, Wyoming

Reichstein, Frank A., Beloit Daily News, Beloit, Wisconsin

Relena, K. E., Farmer Seed & Nursery Company, Paribault, Minnesota

Remyard, C. B., Campbell Soup Company, Riverton, New Jersey

Richardson, Jr., R. W., Rockefeller Foundation,  
London 15, Mexico 6, D. F.

Richards, R. H., Bihar Agricultural College,  
Sabour P. O. (Bhagalpur) Bihar, India

Rick, C. M., Department of Vegetable Crops,  
University of California, Davis, California

Rios, G. Mario, Gomez Farias No. 149-6, Mexico, D. F.

Robinson, R. W., 5321 N. Acacia Street, San Gabriel, California
Roever, W. E., West Tennessee Experiment Station,  
Jackson, Tennessee

Sawant, Anand C., Department of Vegetable Crops,  
University of California, Davis, California

Schneider, L. C., Department of Horticulture,  
Rutgers University, New Brunswick, New Jersey

Schultz, J. H., Department of Horticulture,  
North Dakota Agricultural College, Fargo, North Dakota

Scott, Wilbur, Joseph Harris Company, Inc., Morocon Farm,  
Rochester 11, New York

Sen, Hiralal K., Department of Botany,  
Presidency College, Calcutta, India

Shiffler, Oved, The Weizmann Institute of Science, Rehovoth, Israel

Singh, H. B., Division of Botany,  
Indian Agricultural Research Inst., New Delhi, India

Skinner, George W., F. H. Woodruff & Sons, Milford, Connecticut

Smith, James J., The Quaker Maid Company, Inc.,  
Brockport Cannery, Brockport, New York

Smith, P. G., Department of Vegetable Crops,  
University of California, Davis, California

Soost, R. M., Citrus Experiment Station,  
University of California, Riverside, California

Stark, F. C., Jr., Department of Horticulture,  
University of Maryland, College Park, Maryland

Stevenson, E. C., Department of Horticulture,  
Purdue University, Lafayette, Indiana

Taylor, J. Wm., LeGrand P. C., California

Tezier, Claude, Tezier Freres,  
27 Ave. Gambetta, Valence Sur-Rhone, France

Thompson, A. E., Department of Horticulture,  
University of Illinois, Urbana, Illinois

Tomes, M. L., Department of Plant Pathology,  
Indiana Agric. Expt. Station, Lafayette, Indiana


Walkof, Charles, Experiment Farm, Morden, Manitoba, Canada

Walker, J. M., Box 576, Vegetable Crops Lab., Bradenton, Florida

Watson, Ross D., Department of Plant Pathology,  
University of Idaho, Moscow, Idaho

Whaley, W. G., Department of Botany, Univ. of Texas, Austin, Texas

Woolfitt, C. E., Dominion Lab. of Plant Path.,  
Department of Agriculture, Summerland, British Columbia

Yamashita, Kosuke, Yoshida College, Kyoto Univ., Kyoto, Japan

Yarnell, S. H., U.S. Regional Vegetable Breeding Lab.,  
U. S. D. A., Box 177 St. Andrews Branch, Charleston, S. C.

Yeager, A. F., University of New Hampshire, Durham, N. H.

York, Thomas L., Department of Plant Breeding,  
Cornell University, Ithaca, New York

Young, Harold W., Horticulture Department,  
Ohio State University, Columbus, Ohio

Young, F. A., Tomato Disease Lab., Rt. 4, Jacksonville, Texas

Young, Robert E., Field Station,  
University of Massachusetts, Waltham 51, Massachusetts

deZepa, Ingo Dora N., Catedra de Genetica,  
Facultad de Ing. Agronomica, Maracaibo, Venezuela
PART III LIST OF DESIRED STOCKS

Alexander, L. J. Members are invited to send their exchange stocks to Dr. Alexander for screening by pathologists for disease resistance.

Andrus, C. F. Any true-breeding non-lethal chlorophyll-deficient line.

Bishop, C. J. Sources of resistance to late blight.

Harrison, A. L. Breeding lines that carry resistance to any of the various types of mosaic.

Nonnecke, I. L. Any lines of L. peruvianum not listed in the Seed List for 1949-50 from the P. I. Station, Ames, Iowa, as well as any crosses between L. peruvianum and L. esculentum.

Any other material suspected to possess cold or frost resistance or low temperature fruit set.

Pearson, C. H. Lines that have little or no gelatinous matter surrounding seeds.

Pollack, B. L. Any line that shows some degree of resistance to "gray wall".

Reynard, G. B. $u^{2}u^{2} (u^{2}u^{2})$ Any types with extra dark green unripe fruit.

Rick, C. M. Any line that is jointless but not leafy ($l^{1}l^{1}$).

Smith, J. J. Stocks resistant to anthracnose.

Whaley, W. G. Any haploid lines.
BIBLIOGRAPHY OF PAPERS ON TOMATO GENETICS AND BREEDING PUBLISHED IN 1952

Baldwin, P. G., 1952 Vegetative hybridization of the tomato. Agrobiologija No. 4: 142-145.


Burdick, A. B., 1952 Experimental evidence relating to one postulate of the new Russian genetics. Genetics 37: 570. (Abstract)

Butler, L., 1952 The linkage map of the tomato. J. Hered. 43: 25-35.


Gallagly, M. E., 1952 Sources of resistance to two races of the tomato late blight fungus. Phytopathology 42: pp. 466. (Abstract)


Korneev, A. P., 1952 (A tomato marvel.) Sad i Ogorod No. 1: 74-75.


Turbin, N. V., 1952 (The fertility of plants and vitality of their seed progeny in relation to the state of aging of the reproductive organs.) Bot. Z. 37: 764-772.


**PART V**

**FINANCIAL STATEMENT**

(to December 31, 1953)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$ 29.02</td>
</tr>
<tr>
<td>Balance from 1953</td>
<td></td>
</tr>
<tr>
<td>Receipts</td>
<td></td>
</tr>
<tr>
<td>Assessments</td>
<td>$130.00</td>
</tr>
<tr>
<td>Sale of back numbers</td>
<td>20.00</td>
</tr>
<tr>
<td>Assets</td>
<td>179.02</td>
</tr>
<tr>
<td>Expenditures</td>
<td></td>
</tr>
<tr>
<td>TGC Report No. 3, 1953</td>
<td></td>
</tr>
<tr>
<td>Photographic paper</td>
<td>6.35</td>
</tr>
<tr>
<td>Postage</td>
<td>10.30</td>
</tr>
<tr>
<td>Clasps</td>
<td>1.75</td>
</tr>
<tr>
<td>Envelopes</td>
<td>1.85</td>
</tr>
<tr>
<td>Multilithing</td>
<td>82.70</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
</tr>
<tr>
<td>Mimeographing newsletter</td>
<td>6.90</td>
</tr>
<tr>
<td>Postage</td>
<td>1.75</td>
</tr>
<tr>
<td>Balance</td>
<td>67.42</td>
</tr>
</tbody>
</table>

**MEMBERSHIP STATUS**

- Assessments paid for 1953: 17
- Assessments paid for 1954: 124
- Assessments paid for 1955: 4
- Assessments paid for 1956: 4

Total members: 149
CORRECTIONS OF ERRORS IN TGC REPORT NO. 3

Page 2, first line of page, for "250" read "300".

Page 2, first line of third paragraph, for "manifested" read "manifest".

Page 33, eighth line from bottom of page, for "anthocyanin" read "anthocyanin".