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## J. T. Rosa, Jr. (1895-1928) Pioneer in Vegetable Crop Research<sup>1</sup>

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The tragic and sudden death of J. T. Rosa, Jr. occurred at a comparatively early age in the midst of what surely was to be his most productive years.<sup>3</sup> He left behind him, however, a legacy of more completed, and more seminal research than most of us are likely to accomplish, should we be lucky enough to survive the hazards of modern day living to reach the biblical age of three score and ten. As I am one of the few people (living) who knew Professor Rosa from the vantage point of a student, I wish to record my recollections of this inspiring teacher and productive scientist. In completing this task, I have had the assistance of three individuals: V. R. Boswell, H. A. Jones and Gilbert W. Scott. Dr. Jones was a colleague, and Drs. Boswell and Scott were students of Dr. Rosa and worked under his supervision.

As an undergraduate student at the University of California, Davis, I was most impressed with the number and diversity of programs Dr. Rosa had in progress at any one time. Currently, it is fashionable for an investigator to focus his research energies on one, or at most, two crops. Dr. Rosa had research projects in progress simultaneously on potatoes, spinach, beans, tomatoes, watermelons, muskmelons and cucumbers. These projects were not mere paper exercises, but actual field and laboratory studies in depth, from which much fundamental information was derived and reported. Dr. Rosa was an awesome bundle of restless energy, welldisciplined, and well-directed. Although he seemingly never ran out of energy, he occasionally ran out of time. To counter this uncontrollable annoyance, he arose early, and was on the job by 5:00 AM during the muskmelon pollinating season.



Joseph Tooker Rosa, Jr.

As a teacher, Dr. Rosa was a matterof-fact lecturer, casually presenting his material on a take it or leave it basis. But in the laboratory and in the field, by precept and example, he instilled in his students and younger associates a thirst for knowledge that remained with them indefinitely. During my undergraduate days, I served as assistant to Dr. Rosa, collecting data and pollinating muskmelons and cucumbers, measuring beans, and serving in other capacities as needed.

Dr. Rosa was a gentle, kindly, courteous man; patient and precise in explaining the techniques needed to perform the task at hand. He was tolerant, yet firm, in correcting the mistakes that inevitably occurred. Always a goodhumored optomist, he had no difficulty in relating to students, particularly to those of us in the less-affluent category. This empathy probably flowed from his own experience as an undergraduate. He is reported to have worked his way through 4 years of college at Clemson (now Clemson University) subsisting mostly on a spartan diet of peanut butter, bread and milk, supplemented by scavenging fruits and vegetables in season.

Dr. Rosa readily adapted new knowledge and techniques from diverse disciplines to solve practical problems that arose in his own research. At an early date (1926), he decided that the new science of genetics had much to offer plant breeding. To understand the fundamentals of inheritance, he took time from his busy schedule of teaching and research to audit a class in genetics for undergraduates and graduates. The class was taught by a well-known geneticist, J. L. Collins. In addition to his talents

<sup>&</sup>lt;sup>1</sup>See Jones, H. A. 1928. Joseph Tooker Rosa, Jr. *Proc. Amer. Soc. Hort. Sci.* 25:397, for curriculum vitae. Dr. Rosa was survived by his wife, Bess, nee Naylor, a professional home economist, and 4 children.

<sup>&</sup>lt;sup>2</sup>I am grateful to professors O. A. Lorenz and C. M. Rick of the Univ. of Calif., Davis, Department of Vegetable Crops, for making available the photograph and other material in the files of the Department.

<sup>&</sup>lt;sup>3</sup>The cause of Dr. Rosa's sudden death remains a mystery. Feeling badly, he left the field in the afternoon for home and went to bed. The next day he died. His physicians suspected a virulent virus, but the 'exact cause was not determined.

as an investigator, Dr. Rosa was a skillful expositor of his own reserach. He wrote easily, in simple, direct prose, or to use V. R. Boswell's earthy expression, in "barnyard English".

It is always risky to attempt an impartial assessment of the contributions of a scientist who at the same time was your mentor and valued friend. But looking down the corridors of time, from a distance of almost half a century, it seems clear to me that there are at least 4 notable contributions for which Dr. Rosa should be credited with having had an equal or major role. Each had a formidable impact on Horticulture in this country.

1. The text, *Truck Crop Plants*, authored by H. A. Jones and J. T. Rosa, Jr., and published in 1928, has proved to be an invaluable reference source. Forty-eight years after publication, it remains one of the best reference works on vegetable crops yet produced in this country. Researchers and extension people inform me that this book is one of the most useful on their shelves. The book has long been out of print, but the basic information is timeless.

2. Professor Rosa was a key member of the team that developed the muskmelon cultivar, 'Powdery Mildew Resistant 45'. Through his contacts with students from India, he persuaded them on returning to their homeland to send him seeds of muskmelons (Cucumis melo L.). This material from various areas of the Indian subcontinent was used in the cantaloupe breeding program. The seed, when received, was immediately sent to the Imperial Valley of California for testing for resistance to powdery mildew. The causal organism of this disease, Sphaerotheca fuliginea, usually appears in epiphytotic proportions in the Imperial Valley during the Spring. It had become so destructive that cantaloupe growers were desperate for relief.

Subsequent tests indicated that amongst the Indian material were genotypes with a high level of resistance to powdery mildew, but they had the disadvantage of having extremely poor horticultural characteristics. The transfer of the gene or genes responsible for powdery mildew resistance to individuals with a satisfactory horticultural background was accomplished within a relatively short time period. The result was the release of 'PMR45' in 1936. This cultivar revolutionized the cantaloupe industry because it made possible the transportation and arrival of vine-ripened, high quality fruit at even the most distant markets in the continental U.S. This project was completed by I. C. Jagger and G. W. Scott, but Dr. Rosa supplied the gene source and had a vital role in the initial breeding sequence.

3. In a series of 5 papers published

from 1926 through 1928, Dr. Rosa presented his research findings on various aspects of muskmelon production, such as, "The direct effect of pollen on the fruits and seeds of melon"; "Results of in-breeding melons"; "Changes in the composition during ripening and storage of melons"; and with E. L. Garthwaite, "Cantaloupe production in California". Perhaps the most important paper of this series was his classical erfort (Hilgardia 3:233-250, 1928), "The inheritance of flower types in Cucumis and Citrullus". This paper has been widely and persistently cited. Publication of this information inaugurated a series of investigations of sex expression in cucurbits, that eventually culminated in the commercial production of F1 hybrids for cucumbers and squash.

4. Dr. Rosa was a primary investigator of sex expression in spinach. He

identified the several types of sex expression in this vegetable. Moreover, he quickly became convinced that sex expression and sex ratio were genetically controlled, since environmental modification such as soil fertility, plant spacing, light intensity, planting date, and mutilation, had little phenotypic effect on either process. These studies were the spade work that developed into a lengthy series of investigations by others of the inheritance of sex expression in spinach, the identification of a sex chromosome, and later, to the development of F<sub>1</sub> hybrids to produce the commercial crop.

The record clearly demonstrates that J. T. Rosa, Jr. was one of the foremost horticulturists of his time. His sound experimental work has provided the basic information and inspiration for much modern research in vegetable crops.

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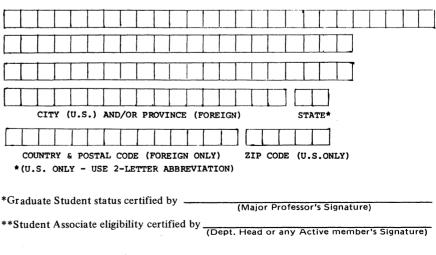
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