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DEVELOPMENT OF SWEET JALAPEÑO PEPPERS AT TEXAS A&M UNIVERSITY IS A MILESTONE IN CAPSICUM HISTORY

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Chile, ***Capsicum sp***., is the number one spice ingredient in the world because of capsaicin, the heat compound, and the nutritional and health aspects of the pod. Capsaicin has deterred some people from consuming this highly nutrition vegetable. The suppression of the genes involved in capsaicin synthesis in hot chile, especially jalapeños at the Texas Agricultural Experiment Station (TAES) in Weslaco proved to be a tremendous economic boon to the salsa picante industry in the U.S.A. and helped promote capsicums around the world.

JUSTIFICATION: Mexican food is the number one ethnic food in the U.S.A. The cuisine is infused with different types of chile depending on the region of Mexican origin. Each capsicum type imparts a distinctive and unique flavor on food depending on the type of chile used. Jalapeños contain independent capsaicin and flavor genes that can be manipulated. Jalapeños without the capsaicin genes were developed inadvertently while seeking multiple virus and insect resistant genotypes at TAES. Restoring the original jalapeño flavor genes was extremely difficult.

Vegetable breeding at TAES, a highly specialized technology, is responsible for a large segment of the current progress in Texas agriculture. The adverse sub-tropical environment at the Weslaco Research Center provides ideal conditions for developing improved cultivars with a wide range of adaptability to the rest of the U.S.A. and other countries.

CASE IN POINT: During the 1960's, aphid transmitted viral diseases significantly reduced bell pepper yields in the Lower Rio Grande Valley of South Texas. A virology-breeding position was created in 1970. Research efforts to solve the problems were initiated by the author on January 1971. Emphasis was placed on obtaining genetic resistance to important bell pepper viruses because existing cultivars were susceptible to the main viruses found. The virus resistance screening program yielded fifteen (15) different genotypes possessing heritable resistance to local isolates of: tobacco etch virus (**TEV**), the main virus in the area, potato virus Y (**PVY**), tobacco mosaic virus (**TMV**), pepper mottle virus (**PeMV**), cucumber mosaic virus (**CMV**), and tobacco ringspot virus (**TRSV**). These resistant genotypes mainly possessed small, slightly elongated pungent and non-pungent fruits. Hybridization of these stocks with the best available commercial bell cultivars yielded hundreds of resistant F_2 plants possessing fruits of different shapes, colors, and pungency levels. Commercial long/green chile, high color paprika, jalapeño, serrano, ancho, pimiento, cayenne, cherry, and yellow wax pickling types were crossed on to their respective resistant types. Segregating F_2 generations yielded hundreds of different virus resistant pepper types including the hot, mild, and **sweet jalapeño** by early **1973**. Pedigrees are available. This is the first report of the development of sweet jalapeño peppers ever. During the first five years, thousands of multiple virus and insect resistant breeding lines representing 17 different pepper types were developed. These lines possessed tropically adaptive genes (set fruit at high temperatures), high quality fruit attributes and machine harvestable characteristics. Nine new and improved varieties have been released representing bells, long green chiles, serranos, yellow wax (hot and sweet), yellow jalapeño, hot jalapeño, and a **mild jalapeño**. Many of the advanced lines are ready to be released as improved cultivars. This germplasm is now being utilized in breeding programs worldwide. The **TAM Mild Jalapeño-I** (TMJ-I) was officially released in 1981 and revolutionized the entire salsa picante industry, which outsold tomato ketchup in 1990 and thereafter. The salsa industry was estimated at over $1 billion dollars by 1997. More TMJ-1 seed was sold than any other jalapeño seed for about 5 years. The hot TAM Veracruz jalapeño was released in 1989 and was the leading variety for several years outyielding virus susceptible commercial hybrids in several areas. The sweet jalapeño was named **Dulcito,** in the early **1980's** by **Dr. Leon Keith Shepherd, Chandler, Arizona and U.S. Air Force Major General Walter H. Baxter, Jr., Weslaco, Texas** but was never officially released by TAES due to lack of interest from major seed companies. During the last 25 years there has been an increasing demand by major processing firms for a uniformly non-pungent (sweet) jalapeño and that has motivated the TAES pepper breeding to release these sweet varieties in the very near future.

Many of these improved pepper lines contain high concentrations of antioxidants such as ascorbic acid, b-carotene and flavonoids (quercetin and luteolin). These compounds have been demonstrated to contain anti-cancer properties. Subsistence farmers throughout the world will be able to grow these chiles with more security and at less cost. Increased food production is accomplished utilizing fewer chemicals and less acreage, making it easier to maintain environmental quality. This has important implications for more efficient production of other foods in a sustainable agriculture system.