Chao-Chien Jan

Research Geneticist
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Education

1962-1966	Chung-Hsing University, Taiwan; major, agronomy; B.S. 1966
1967-1969	University of California, Davis, CA; major, agronomy; M.S. 1969
1969-1974	University of California, Davis, CA; major, genetics; Ph.D. 1974

Work Experience

1974-1975	Lecturer, Department of Plant and Soil Science, California Polytechnic State University, Pomona
1975-1975	Postgraduate Research Biologist, Cancer Research Institute, University of California, San Francisco
1975-1981	Postgraduate Research Agronomist, Department of Agronomy and Range Science, University of California, Davis
1981-1984	Research Geneticist, USDA-ARS, Davis, California
1984-present	Research Geneticist, USDA-ARS, Fargo, ND

Recent Accomplishments

Dr. Jan developed a new technique of seed treatment to enhance germination, a new embryo rescue method for establishing difficult interspecific hybrids, and an efficient chromosome doubling technique to improve F_1 hybrid fertility, enabling the production of BC_1F_1 progenies and the production of amphiploids. The interspecific sunflower amphiploids of Dr. Jan's program are the only ones ever produced, and were used successfully as bridges for gene transfer to develop resistant sunflower lines for the newly identified broomrape race F, which attacks all sunflower hybrids available in Spain. The chromosome doubling technique successfully produced the only trisomic genetic stocks in cultivated sunflower. He was the first to use chemical mutagens in an innovative effort to create new sources of cytoplasmic male sterility and nuclear male sterility in cultivated sunflower. Dr. Jan was the first to identify cytoplasmic male sterility sources and fertility restoration genes directly from their respective wild *H. annuus* accessions, eliminating the need for laborious identification of restoration genes in cultivated lines, and has identified fertility restoration genes for many cms sources previously considered non-restorable by other programs. He also was the first to report a unique cytoplasmic-nuclear interaction between diploid perennial cytoplasmic and cultivated nuclear genes, resulting in plants with reduced vigor, and showed that normal plant vigor can be restored by single dominant genes from wild perennial *Helianthus* species. This discovery is expected to have significant impact on future utilization of perennial species' cytoplasm while maintaining plant vigor.

Recent Peer-reviewed Publications:

Chandler, J. M., **C. C. Jan,** and B. H. Beard. 1986. Chromosomal differentiation among the annual *Helianthus* species. Systematic Bot. 11:354-371.

Jan, C. C., J. M. Chandler, and S. A. Wagner. 1988. Induced tetraploidy and trisomics production of *Helianthus annuus* L. Genome 30:647-651.

Jan, C. C., B. A. Vick, J. F. Miller, A. L. Kahler, and E. T. Butler, III. 1998. Construction of an RFLP linkage map for cultivated sunflower. Theor. Appl. Genet. 96:15-22.

Jan, C. C. 2000. Cytoplasmic male sterility in two wild *Helianthus annuus* L. accessions and their fertility restoration. Crop Sci. 40:1535-1538.

Rahim, M., **C. C. Jan,** and T. J. Gulya. 2002. Inheritance of resistance to sunflower downy mildew races 1, 2, and 3 in cultivated sunflower (*Helianthus annuus* L.). Plant Breed. 57:57-60.

Jan, C. C., J. M. Fernández-Martínez, J. Ruso, and J. Muñoz-Ruz. 2002. Registration of four sunflower germplasms with resistance to *Orobanche cumana* Race F. Crop Sci. 42:2217-2218.

Jan, C.C., T. X. Zhang, J. F. Miller, and G. N. Fick. 2002. Inheritance of fertility restoration for two cytoplasmic male sterility sources of *Helianthus pauciflorus* (*rigidus*) Nutt. Crop Sci. 42:1873-1875.

Jan, C.C. 2003. Silencing of fertility restoration genes in sunflower. Helia 26:1-6.

Jan, C.C., Z. Quresh, and T. J. Gulya. 2004. Registration of seven rust resistant sunflower germplasms. Crop Sci. 44:1887-1888.

Jan, C.C., A. S. Tan, and T. J. Gulya. 2004. Registration of four downy mildew resistant sunflower germplasms. Crop Sci. 44:1887.

Chen, J., J. Hu, B. A. Vick, and **C. C. Jan.** 2006. Molecular mapping of a nuclear male-sterility gene in sunflower (*Helianthus annuus* L.) using TRAP and SSR markers. Theor. Appl. Genet. 113:122-127.

Feng, J., B. A. Vick, M.-K. Lee, H.-B. Zhang, and **C. C. Jan,** 2006. Construction of BAC and BIBAC libraries from sunflower and identification of linkage group-specific clones by overgo hybridization. Theor. Appl. Genet. 113:23-32.

Jan, C.C. 2006. Registration of two cytoplasmic male-sterile and eight fertility restoration sunflower genetic stocks. 2006. Crop Sci. 46:1835-1836.

Jan, C.C., and T. J. Gulya. 2006. Registration of three virus resistant sunflower genetic stocks. Crop Sci. 46:1834-1835.

Jan, C.C., and T. J. Gulya. 2006. Registration of a sunflower germplasm resistant to rust, downy mildew and virus. Crop Sci. 46:1829.

Jan, C.C., J. F. Miller, G. J. Seiler, and G. N. Fick. 2006. Registration of one cytoplasmic male-sterile and two fertility restoration sunflower genetic stocks. Crop Sci. 46:1835.

Jan, C.C., J. F. Miller, B. A. Vick, and G. J. Seiler. 2006. Performance of seven new cytoplasmic male-sterile sunflower lines from induced mutation and a Native American variety. Helia 29:47-54.

Jan, C.C., and B. A. Vick. 2006. Registration of seven cytoplasmic male-sterile and four fertility restoration sunflower germplasms. Crop Sci. 46:1829-1830.

Jan, C.C., and B. A. Vick. 2007. Inheritance and allelic relationships of fertility restoration genes for seven new sources of male-sterile cytoplasm in sunflower. Plant Breed. 126:213-217.

Velasco, L., B. Pérez-Vich, **C. C. Jan,** and J. M. Fernández-Martínez. 2007. Inheritance of resistance to broomrape (*Orobanche cumana* Wallr.) race F in a sunflower line derived from wild sunflower species. Plant Breed. 126:67-71.