ANNUAL REPORT OF COOPERATIVE REGIONAL PROJECTS
Supported by Allotments of the Regional Research Fund
Hatch Act, as Amended August 11, 1955
January 1 to December 31, 1987

1. PROJECT: S-9 Plant Germplasm - Its Introduction, Maintenance and Evaluation

2. COOPERATING AGENCIES AND PRINCIPAL LEADERS:

State Experiment Stations and Representatives

Ala.	J. F. Pedersen*[1]	N. C.	W. T. Fike*
Ark.	T. E. Morelock*,Chm.	Okla.	J. S. Kirby*
Fla.	G. M. Prine*	P. R.	G. J. Fornaris*
Ga.	C. S. Hoveland*	S. C.	D. W. Bradshaw*
Ha.	P. J. Ito*	Tenn.	D. L. Coffey*
Ky.	N. Taylor*	Tex.	G. G. McBee*
La.	A. M. Thro*		
Miss.	C. E. Watson*	Va.	R. E. Veilleux*

Administrative Advisor — G. F. Arkin

U. S. Department of Agriculture

Co-Administrative Advisor, ARS — E. L. Corley

National Program Staff, ARS	H. L. Shands
Germplasm Resources Lab, ARS	G. A. White*
National Seed Storage Lab, ARS	S. A. Eberhart
Subtropical Hort.Res.Stn.,ARS	R. J. Knight
Tropical Agri. Res. Stn.,ARS	E. Vazquez
Northern Reg. Res. Center,ARS	R. Kleiman
Cooperative State Res. Serv.	S. G. Wiggans
Soil Conservation Service	H. W. Everett*

Southern Regional Plant Introduction Station, Cooperative ARS and SAES

Regional Coordinator	G. R. Lovell
Research Pathologist	A. G. Gillaspie
Research Horticulturist	R. L. Jarret
Curator, Horticulturist	R. N. Pittman

*Indicates voting members of the Technical Committee
[1] Resigned Effective 1987, Position Vacant.

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS:

Germplasm of 1,619 new Plant Introductions (PI's) were added to the S-9 Project plant germplasm collections. Sorghum, peanuts, sesame and squash were the major crops received. The collections of PI's now total 56,908. Distribution of seed packets totaled 29,224. The S-9 Region 12,182 packets; NC-7 Region 4,134; NE-9 Region 477; W-6 Region 312 Shipments to the National Seed Storage Laboratory for long-term storage included 683 PI's of various crop groups. In response to international requests 6,938 seed packets were shipped to 35 countries.

Facilities for the operation of the in vitro sweet potato germplasm maintenance laboratory were completed. One-hundred and twenty sweet potato clones were received as tissue cultures from plant quarantine in Glenndale, MD and are being maintained in vitro. These materials are being made available on request. Various experiments are being conducted in order to determine suitable storage conditions for the cultures which will maximize the period of time between recultures. Two-hundred sweet potato clones consisting of heirloom cultivars and plant introductions were transferred from the U. S. Vegetable Laboratory in Charleston, SC to the Clonal Repository in Experiment. This germplasm is being maintained in a greenhouse. At the present time, these sweet potato clones are being meristem cultured and will subsequently be assayed for virus infection prior to their introduction into the clonal collection and their distribution. All clones received to date are scheduled for field evaluation in the summer of 88.

Field studies were done to determine the epidemiology of peanut stripe virus (PSTV) on soybean. The test to determine spread of PSTV from peanuts to soybeans was eaten by deers and the test to determine yield effects in soybeans had insufficient infection of plants. Laboratory facilities for pathology work have now been remodeled and are functioning.

More than 7800 cultivated Arachis accessions were maintained for distribution. During the year, 400 accessions were distributed to three foreign countries and 3,244 accessions were distributed to 35 scientists within the United States. One hundred accessions free of peanut stripe virus were increased in the field. Thirty-three new introductions from China are being increased in the greenhouse and evaluated for Peanut Stripe and Peanut Mottle Virus before releasing the material for distribution.

The S-9 Technical Committee met July 21-22, 1987 at Texas A&M University, College Station. Progress reports for each participating member are recorded and included with the minutes of the meeting.

4. USEFULNESS OF FINDINGS:

Results obtained through this project at the regional station, at state experiment stations, by federal agencies, and by private enterprise are mutually beneficial to plant breeders and other plant scientists, and through them ultimately to the public. Desirable traits found in plant introductions can be used to develop superior varieties thereby increasing the efficiency of production and reducing the need for pesticides. Through work at the regional station seed of world collections of economic crops is maintained for

future use. New information gained from cultural studies of potential crops may lead to greater diversification of agriculture.Crop varieties released in 1987 by participants in the project are listed in Supplement I.

5. WORK PLANNED FOR NEXT YEAR:

The Regional Plant Introduction Station will continue to receive, propagate, and catalogue plants for distribution to plant breeders and other cooperators. Screening studies will be continued to locate resistance to insects and disease. The evaluation and classification of the Ethiopian Sorghum Collection will be continued through several cooperative agreements with University and ARS plant scientists in Puerto Rico, Georgia, Oklahoma, and Texas. The evaluation and assay of peanut lines suspected of contamination by the new Peanut Stripe Virus will continue and the increase of virus-free seed will be accelerated. The Plant Introduction Station will initiate research with bananas (Musa) to assist Hawaii and Puerto Rico in the genetic identification and improvement of their banana germplasm. Techniques for the isolation of intact chloroplasts from Musa leaf tissue will be further refined and more efficient techniques for the purification of organelle DNA from isolated organelles will be developed. cpDNA will be digested with a range of restriction endonucleases and fragments will be separated on agarose gels.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS APPROVED DURING THE YEAR:

A list of publications related to evaluation and use of plant germplasm in the Southern Region are listed in Supplement II to this report.

7. APPROVED:

2/11/88
DATE

T. E. Morelock, Chairman,
Technical Committee

2/22/88
DATE

G. F. Arkin, Adm. Advisor

Supplement I

Crop Varieties and Germplasm Lines

Cultivar or Germplasm Release	Genus & Species	Released by	Year	P.I. Number	Origin
'Brown Loam Syn. No. 2" White Clover	Trifolium repens	USDA ARS & MAFES	1987		
'Carostan' Flaccidgrass	Pennisetum flaccidum	NC AES	1987	220606	Afghanistan
'SNLL-87'	Lupinus angustifolius	USDA ARS & GA AES	1987	168535	Portugal
'Sweet Red' Sweet Potato	Ipomoea batatas	NC AES	1987		
'US-311' Southernpea	Vigna unquiculata	US Veg. Lab, USDA ARS	1987		
'US-427' "	" "	" "	1987		
'Kiawah' "	" "	" "	1987		
'WW-Iron Master'Bluestem	Bothriochloa spp.	USDA ARS & USDA SCS	" 1987	301535	Afghanistan
'Georgia Red' Peanut	Arachis hypogaea	GA AES	1987	508278	Georgia
'Excel' Sweet Potato	Ipomoea batatas	US Veg. Lab, USDA ARS	1987 1987		
'Flame' Crimson Clover	Trifolium incarnatum	Fla. AES	1987		
'Century' Wheat	Triticum aestivum	OK AES & USDA-ARS	1987		

Supplement II

Publications Related to Evaluation and Use of Plant Germplasm in the S-9 Region, 1987.

ARKANSAS

C. S. Enders and D. E. Longer. 1987. Herbicide selectivity among grain and weedy amaranthus species. Agronomy Journal. In Press.

Paterson, R. G., S. J. Scott and R. Gergerich. 1987. Epidemiology and genetic resistance in tomato to tomato spotted wilt virus in Arkansas. HortScience (in press) (Abstr.)

FLORIDA

Baltensperger, D. C., G. M. Prine and R. A. Dunn. 1986. Root-knot nematode resistance in Arachis Glabrata. Peanut Sci. 13:78-80.

Mislevy, P., R. S. Kalmbacher, A. J. Overman and F. G. Martin. 1986. Effect of Fertilizer and Nematicide Treatments on Crops Grown for Biomass (11(4):243-253.

Orthman, A. B. and G. M. Prine. 1986. Biomass production and nutrient removal by leucaena in colder subtropics. In Biomass Energy Development, Plenum Press, New York, N.Y. p. 95-102.

Prine, G. M., L. S. Dunavin, Paul Mislevy, K. J. McVeigh and R. L. Stanley. 1986. Registration of 'Florida 80' annual ryegrass. Corp Sci. 26:1083-1084.

Prine, G. M., L. S. Dunavin, J. E. Moore and R. D. Roush. 1986. Registration of 'Florigraze' rhizoma peanut. Crop Sci. 26:1084-1085.

Prine, G. M., C. S. Gardner, D. S. Calhoun, K. R. Woodard and T. R. Burton. 1986. Progress report on developing elephantgrass as biomass (energy) crop in colder subtropics. Agronomy Abstracts, 1986 annual meeting at New Orleans, La. p. 121.

Prine, G. M. L. S. Dunavin, B. J. Brecke, R. L. Stanley, P. Mislevy. R. S. Kalmbacher, and D. R. Hensel. 1987. Model Crop Systems - Sorghum - Napiergrass. In press. In W. H. Smith and J. R. Frank (ed.) Methane from biomass-a systems approach. Elsevier Applied Science Publishers, Ltd., Barking, England.

Reddy, K. C., A. R. Soffes, and G. M. Prine. 1986. Tropical legumes for green manure. I Nitrogen production and effects on succeeding crop yields. Agron. J. 78:1-4.

Reddy, K. C., A. R. Soffes, G. M. Prine, and R. A. Dunn. 1986. Tropical legumes for green manure. II Nematode populations and their effects on succeeding crop yields. Agron. J. 78:5-10.

Rusland, G. A., L. E. Sollenberger, K. A. Albrecht, and L. V. Crowder. 1986. Animal performance on two summer pasture systems in Florida: Limpograss-N vs. limpograss-aeschynomene. Agron. Abst. p. 1114.

Scott, J. W. and J. P. Jones. 1986. Monogentic resistance in tomato to Fusarium oxysporum F. sp. lycopersici race 3. Euphytien (in press).

Sollenberger, L. E., and C. S. Jones, Jr. 1986. Animal performance on dwarf elephantgrass and bahiagrass pastures. Agron. Abst. p. 144.

Sollenberger, L. E., M. J. Williams, and C. S. Jones, Jr. 1987. Dwarf elephantgrass: A high quality forage with potential in Florida. Fla. Beef Cattle Short Course Proceedings. Univ. of Florida, Gainesville, pp. 76-81.

Taylor, S. G., and D. D. Baltensperger. 1987. Seedling vigor of selected Alysicarpus accessions. Agron. J. 79:101-103.

Valentim, J. F., O. C. Ruelke, and G. M. Prine. 1987. Interplanting of Alfalfa and Rhizoma Peanut. Soil and Crop Sci. Soc. Fla. Proc 46: In Press.

Williams, M. J. 1987. Establishment and Winter Survival of Leucaena spp. and Gliricidia sepium in the Cold Subtropics. Leucaena Res. Rep. (in press).

HAWAII

Hamilton, R. A. 1986. Present status of tropical fruit germplasm collection in Hawaii. International Germplasm Meeting (IBPGR), Malaysia, 3 pages.

Hamilton, R. A., C. L. Chia & P. J. Ito. 1986. Recommended fruits and nuts for the home and gardens. HITAHR Brief No. 052, 2 pages.

Hartmann, R. W. and P. J. O'Malley. 1986. Tomato spotted wilt virus resistance in lettuce, (Lactuca sativa L.). HortScience 21:790. (Abstr.)

O'Malley, P. J. 1987. Inheritance of resistance to tomato spotted wilt virus in lettuce (Lactuca sativa L.). MS Thesis, University of Hawaii, Manoa, 78 pp.

Ragone, Diane. 1987. Collecting breadfruit in the Central Pacific. Bull. Pacific Tropical Botanical Garden, Vol. 17 (2):37-41.

KENTUCKY

Carter, C. D. and Snyder, J. C. 1986. Mite respones and trichome characters in a full-sib F family of Lycopersicon esculentum X L. hirsutum. J. Amer. Soc. HortSci. 111:130-133.

Taylor, N. L. 1986. Collecting clovers in Romania. Trifolium conf. Proc. 9:47-51. Guelph, Ontario, Canada.

LOUISIANA

Fontenot, J. F., D. W. Newsom, H. M. Brewer, and P. W. Wilson. 1986 National Potato Germplasm Evaluation and Enhancement Report 56:52-60.

Johnson, J. K., T. W. Keegan, S. R. Schultz, and D. Franke. 1987. American joint vetch for summer-fall grazing. Louisiana Cattleman (Jan.):9,11.

Pantoja, A., C. M. Smith, and J. F. Roginson. 1986. Evaluation of rice germplasm for resistance to the fall armyworm (Lepidoptera:Noctuidae). Environ. Entomol. 79:1319-1323.

Wilson, P. W., F. Pichardo, J. A. Luizzo, W. J. Blackmon, and B. D. Reynolds. 1987. Amino acids in the American groundnut (Apios americana). J. of Food Sci. 32:224-225.

NORTH CAROLINA

Collins, W. W. and J. W. Moyer. 1987. 'Sweet Red' Sweet Potato. HortSci. 22(3):514-515.

Timothy, D. H. and R. J. Kuhr. Notice of Release of the Forage Cultivar 'Carostan' Flaccidgrass.

Werner, J. and D. F. Ritchie, N. C. State University; D. W. Cain and E. I. Zehr, Clemson University. 1986 Susceptibility of Peaches and Nectarines, Plant Introductions, and Other Prunus Species to Bacterial Spot. HortSci. 21(1):127-130.

OKLAHOMA

Armitage, C. R., R. M. Hunger, and J. L. Sherwood. 1987. A comparison of ELISA reactions from dry, frozen, and fresh wheat leaf tissue infected with wheat soilborne mosaic virus. Phytopathology 77:In press (Abstr.).

Bahrani, Z., J. L. Sherwood, and M. R. Sanborn. 1986. Production of monoclonal antibodies to wheat soilborne mosaic virus (WSBMV). Phytopathology 76:1133 (Abstr.).

Banks, D. J. 1987. Collection of peanut, Arachis hypogaea L. (Leguminosae), in Peru. Am. J. Bot. 74:664. (Abstr.).

Banks, D. J. and R. N. Pittman. 1986. Origin, inheritance, and characteristics of a yellow-flowered peanut from Bolivia. Proc. Am. Peanut Res. Educ. Soc. 18:31. (Abstr.)

Berg, W. A., C. L. Dewald, and P. I. Coyne. 1986. Selection for Iron Efficient Old World Bluestems. Journal of Plant Nutrition, 9(3-7):453-458.

Brown, D. A. and R. M. Hunger. 1987. Isolation and partial characterization of a phytotoxin produced by the fungal wheat pathogen Pyrenophora tritici-repentis. Current Topics in Plant Biochemistry and Physiology, Vol. 6 In press (Abstr.).

Culver, J. N., J. L. Sherwood, and H. A. Melouk. 1987. Resistance to peanut stripe virus in Arachis germplasm. Phytopathology 77:640.

Guenzi, A. C. and R. G. Sears. 1986. Cell culture and wheat improvement. Presentation in the symposium 'Use of regenerated plants in crop improvement'. American Society of Agronomy, Agron. Abstr. 78:148.

Hunger, R. M. and J. L. Sherwood. 1986. Effect of wheat soilborne mosaic virus on yield of winter wheat cultivars. Phytopathology 76:1127 (Abstr.).

Johnson, R. C., B. F. Carver, D. W. Mornhinweg, H. Kebede, and A. L. Rayburn. July 1987. Photosynthetic variation in Triticum dicoccoides accessions: photosynthesis and crop yield. Cambridge, UK. 20-24.

Melouk, H. A. and C. N. Akem. 1986. A detached shoot technique for evaluating reaction of peanut genotypes to Sclerotinia minor. Pro. Amer. Peanut Res. and Educ. Society 18:57.

Merkle, O. G., J. A. Webster, and G. H. Morgan. 1987. Inheritance of a second source of greenbug resistance in barley. Crop Sci. 27:241-243.

Moffett, J. O., D. J. Banks, and R. N. Pittman. 1986. Floral visits by honey bees to three caged peanut cultivars. Am. Bee J. 12:833. (Abstr.).

Rafie, A. R., D. E. Weibel, and J. A. Webster. 1987. Using an electronic monitor as a new approach to study the feeding behavior of greenbug biotype E on 3 isogenic lines of sorghum. Proceedings, 15th Biennial Grain Sorghum Research and Utilization Conference, p. 195.

Tyler, J. M., J. A. Webster, and O. G. Merkle. 1987. Use of greenbug biotype mixtures in evaluating wheat seedlings for resistance. Crop Sci. 27:350-351.

Tyler, J. M., J. A. Webster, and O. G. Merkle. 1987. Designations for genes in wheat germplasm conferring greenbug resistance. Crop Sci. 27:526-527.

Tyler, J. M., J. A. Webster, E. E. Sebesta, and E. L. Smith. 1986. Inheritance of biotype E greenbug resistance in bread wheat CI 17882 and its relationship with wheat streak mosaic virus resistance. Euphytica 35:615-620.

Webster, J. A. 1987. Evaluating sorghum lines for resistance to the yellow sugarcane aphid. Proceedings, 15th Biennial Grain Sorghum Research and Utilization Conference. pp. 196-197.

Zarrabi, A. A., J. L. Caddel, and R. C. Berberet. 1986. Host resistance to blue alfalfa aphid in alfalfa germplasm from different geographic origins. North American Alfalfa Improvement Conference.

PUERTO RICO

Beauchamp de Caloni, I., G. Fornaris-Rullan, and L. Aviles-Rodriguez. 1987. Cultivation and acceptability of carrot cultivars. J. Agri. Univ. P.R., 71(3):287-92.

Cruz, J. G. 1987. Efecto de algunos tratamientos de defoliacion en el crecimiento, floracion y produccion de la guanabana (Annona muricata (L.). M.S. Degree Thesis, Univ. P.R., Recinto de Mayaguez, 62 pp.

Escudero, J., G. Fornaris-Rullan, and E. Caraballo. 1987. Yield and tolerance of bell pepper (Capsicum annuum L.) cultivars to potato virus Y isolate from Puerto Rico. J. Agric. Univ. P.R., 71(3):337-40.

Medina-Gaud, S., F. Gallardo, E. Abreu, and R. Ingles. 1987. The insects of nispero (Manilkara zapote (L.) P. Van Roger) in Puerto Rico. J. Agric. Univ. P.R. 71(1):129-132.

TEXAS

Bradshaw, C. D., R. D. Randel, and G. R. Smith. 1985. High performance liquid chromatography analysis of subterranean clover isoflavone levels. Southern Branch ASA Abstracts. p. 5.

Smith, G. R. and R. d. Randal. 1986. Screening subterranean clover for isoflavone concentration using high performance liquid chromatography. American Forage and Grassland Conference.

Smith, G. R. 1986. Development of subterranean clover germplasm with high levels of persistent hard seed. Ninth Trifolium Conference.

Smith, G. R. 1986. A new look at rose clover. Proceedings 1986 Southern Pasture and Forage Crop Improvement Conference. Athens, Georgia.

Smith, G. R. 1985. Rose clover evaluation and selection. TAES CPR 4347:49-50.

Smith, G. R., G. W. Evers, T. J. Gerik, E. C. Holt, M. Hussey, W. R. Ocumpaugh, J. C. Read, and A. M. Schubert. 1986. Evaluation of experimental rose clover at eight Texas locations. TAES CPR 4499:45-47.

Smith, G. r. 1986. Breeding subterranean clover for improved reseeding. TAES CPR 4499:48-49.

VIRGINIA

Baker, D. M. and M. Rangappa. 1987. Examination of beans resistant to airpollutant ozone: A comparative anatomical approach using scanning electron microscopy. Seventh Biennial Research Symposium. October 4-7, 1987, Washington, DC.

Chappelka, A. H., M. Rangappa, P. Gross, and P. S. Genepal. 1987. Differential response of fourteen plant introductions of Phaseolus vulgaris L. to ozone in the field. Bean Improvement Cooperative 30:72-73.

Chappelka, A. H., M. Rangappa, E. Robbins, and P. S. Benepal. 1987. Comparison of ozone symptom expression among plant introductions of Phaseolus vulgar L. between laboratory and field studies. Bean Improvement Cooperative 30:74-75.

Mebrahtu, T. M., M. Rangappa, and P. S. Benapal. 1987. Effect of polycultural system on Mexican bean beetle leaf hopper and corn earworm populations. Bean Improvement Cooperative 30:10-12.

USDA-ARS

Germplasm Introduction & Evaluation Laboratory:

Atchley, A. A. 1986. Germplasm collection strategies for wheat and its wild relatives. Agron. Abstr. 56.

_____ 1987. Climates of sixty-six countries with potential for biomass production. In: Duke, J. A., ed., CRC Handbook of Energy Potential in Developing Countries. CRC Press, Boca Raton, FL 33431.

Briggle, L. W. 1986. Book Review of Gene Manipulation in Plant Improvement. J. P. Gustafson, ed. Plenum Press, New York and London. Review in Cereal Foods World 31:1.

Duke, J. A. and A.A. Atchley. 1986. CRC Handbook of proximate analysis tables of higher plants. CRC Press, Boca Raton, FL 33431.

Perdue, R. E., Jr. 1986. Vernonia galamensis, potential new crop source of epoxy acid. Econ. Bot. 40(1):54-68.

Stern, S. and G. A. White. 1986. USDA Plant Inventory No. 193. 551 pp.

Stern, S. and G. A. White. 1986. USDA Plant Inventory No. 194. 320 pp.

White, G. A. 1986. The National Plant Germplasm System of the United States. Proc. of the Symposium on Plant Genetic Resources of Southeast Asia, Jakarta, Indonesia, August 1985. Pages 61-66.

White, G. A. 1986. The National Plant Germplasm System (NPGS) of the United States. Proc. of Colloquium on 15 years Collection and Utilization of Plant Genetic Resources, Braunschweig, Fed. Rep. of Germany, December 3-6, 1986. Pages 236-239.

Subtropical Horticulture Research Station:

Knight, R. J., Jr. 1986. Alloploid passion fruit hybrids for the temperate zone. HortSci. 21(3):695. (Abstr.)

King, J. R. and R. J. Knight. 1987. Occurrence and assay of estragole in the leaves of various avocado cultivars. J. Agr. and Food Chem. 34(5). (In Press.)

Kushad, M. M., G. Yelenoski, and R. J. Knight. 1986. Changes in avocado polyamines and polyamine synthesizing enzymes in relation to the ethylene biosynthetic pathway. Supplement to Plant Phys. 80:95. (Abstr.)

Kushad, M. M., G. Yelenoski, and R. J. Knight. 1987. Changes in avocado polyamines and their biosynthetic enzymes in relation to the ethylene biosynthetic pathway. Plant Phys. 81. (In Press.)

Tropical Agriculture Research Station:

Sotomayor-Rios, A. 1987. "Potential for and development of forage sorghums in Puerto Rico". Proc. 15th Biennial Grain Sorghum Research and Utilization Conference, Lubbock, Texas.

Sotomayor-Rios, A. 1987. "Response of forage sorghum to cutting intervals in Puerto Rico" Abstract. Ann. Meeting, Carib. Food Crops Soc., St. Lucia.

Sotomayor-Rios, A. 1987. "Response of forage sorghum to tropical photo-period during two years in Puerto Rico". Abstract. Amer. Soc. of Agron., Ann. Meeting, New Orleans, Louisiana.

Southern Regional Plant Introduction Station:

Gillaspie, A. G., Jr. 1987. Method of detecting Clavibacter xyli subsp. xyli from sugarcane leaves. Plant Dis. 71:691-693.

Gillaspie, A. G., Jr. and R. W. Harris. 1987. Serology of strains of sugarcane mosaic virus. Sugar Cane, Autumn 1987 Supplement:30-32.

Gillaspie, A. G., Jr. and R. G. Mock. 1987. World distribution of strains of sugarcane mosaic virus. Sugar Cane 6:11-12.

Jarret, R. L. 1987. Systematic and Evolution in the genus Musa In:G. J. Persley and E. Z. DeLanghe (eds.) Proc. 1st International Workshop on Banana and Plantyain Breeding Straties, Cairns, Australia 13-17 Oct. 86. Inkata Press Pty. Ltd., Australia pp. 182-185.

Jarret, R. L. 1987. Isozymes and allelic diversity in the genus Musa Plant Genetic Resources 70:20-23.

Sito, A., G. H. Parsons, S. J. Kostka, and A. G. Gillaspie, Jr. 1987. Development of ELISA for detection of Clavibactor xyli subsp. xyli. the Causal agent of ratoon stunting disease in sugarcane. Proc. Sixth Int. Corp. Plant Pathogenis Bacteria, p. 878 (Abstr.).