

ANNUAL REPORT

Calendar Year 2008

1. NRSP-6: UNITED STATES POTATO GENE BANK

Introduction, Classification, Preservation, Evaluation and Distribution of tuber-bearing *Solanum* Species.

2. COOPERATIVE AGENCIES AND PRINCIPAL LEADERS

State Agricultural Experimental Stations

Representative

Technical Representatives

Southern Region

Western Region

North Central Region

Northeastern Region

Vice Chair (2009)

Chairman (2009)

Secretary (2009)

J. C. Miller, Jr.

I. Vales

D. S. Douches

W. De Jong

Administrative Advisors

Southern Region

Western Region

North Central Region

Northeastern Region

Lead AA

R. Guthrie

C. Y. Hu

M. Jahn

E. Ashworth

United States Department of Agriculture

Agricultural Research Service

Technical Representative

National Program Staff

Area Director, Midwest Area

C. R. Brown

P. K. Bretting

G. C. Wisler

L. Chandler

Cooperative States Research Education & Extension Service

A. M. Thro

Animal and Plant Health Inspection Service

M. D. Bandla

NRSP-6 Project Leader

J. B. Bamberg

Agriculture Canada

B. Bizimungu

3. PROGRESS AND PRINCIPAL ACCOMPLISHMENTS

A. Introduction of New Stocks

John Bamberg, Alfonso del Rio and Charles Fernandez (US Potato Genebank) had a successful collecting expedition to the Pinaleno Mountains in southeastern Arizona (about 75 miles northeast of Tucson) in late September of 2008 (supported with extramural funding from USDA). They collected 15 new populations. Fruit were harvested on 12 of the collections and live plants were collected for three of the populations, which were later crossed and true seed was produced.

A total of 99 accessions were assigned PI numbers in 2008, with 76 as true seed: eight Bolivian accessions from Spooner's 1993-4 collection trip, 68 accessions from the Polish seed rescue of VIR stocks and 15 accessions collected in Arizona in 2008. Eight accessions were added to the tissue culture collection: three varieties from South Korea, three S locus genetic stocks from Japan, two haploid inducers, and one primitive cultivar from Peru.

The NRSP-6 web page (<http://www.ars-grin.gov/nr6>) has been updated to include all new stocks and screening information. Clients who have ordered from NRSP-6 in the past four years are contacted three times per year informing them of new materials that are now available either as true seed, tubers, in vitro plantlets, or herbarium samples.

B. Preservation and Evaluation of Stocks

In 2008, a total of 221 accessions were increased as botanical seed populations.

A total of 693 potato spindle tuber viroid (PSTVd) tests were performed on seed increase parents, seedlots and research materials. Germination tests were performed for 1497 accessions, ploidy determinations for 21, and tetrazolium seed viability tests for eight.

In cooperation with J. Palta (UW-Madison), it was found that low-cost calcium applications in the highlands of Peru result in a yield increase of 60% for some cultivars. Dr. del Rio began work on identifying DNA markers associated with the calcium response trait. We also received an NRI grant (with cooperators J. Palta, S. Jansky, and M. Havey from UW-Madison) for related work on high tuber calcium genetics and introgression using *S. microdontum* hybrids we developed.

We continued screening for antioxidants and anti-tumor components with USDA cooperator R. Navarre (USDA-Prosser) and J.C. Miller, Jr. (TAMU). Some extremely high phenolic clones were found in *S. phureja/stenotomum* and extracts of *S. jamesii* were found to inhibit colon and prostate cancer. We documented and reported remarkable eight-year dormancy of *S. jamesii* tubers from stocks we collected from New Mexico.

C. Classification

Dr. Spooner et al. have published and are working on five different areas of potato research: 1) molecular markers for genebank studies, 2) cultivated potato origins, 3) relationships in wild tomatoes and potatoes, 4) the predictive power of taxonomy relative to disease resistance data, and 5) a linkage map for late blight resistance in wild potatoes.

D. Distribution

The volume and types of stocks sent to various consignee categories are summarized in the table below. NRSP-6 distributed 168 orders to clients in 30 states of the USA and 30 orders to 14 other countries.

Category	Units of Germplasm Sent ¹							Total	PIs
	S	TF	TC	IVS	DNA	PL	HER		
Domestic	1,854	565	1121	366	0	5	0	3,902	3,559
Foreign	631	91	28	1,033	3	0	0	1,786	870
Total	2,476	656	1149	1,399	3	5	0	5,688	4,429

¹ Types of stocks sent/(number of seeds, tubers or plantlets per standard shipping unit): S= True Seeds/(50), TF= Tuber Families/(10), TC=Tuber Clones/(3), IVS=In Vitro Stocks/(1), DNA=DNA samples/(1), PL=Plants in plugs/(1), Her= Herbarium/(1).

4. IMPACT STATEMENT

Potato is the number one US and world vegetable in terms of production, value, and consumption. Considering its high satiety index and palatability, and its balanced protein, wide adaptability, and high productivity, it will play an increasingly important role in providing food security in developing countries and delivering new health-promoting nutrients to the diets of developed countries. Such food and health benefits carry with them a great economic impact, even in areas where potatoes are not grown. For example, if people in the US consumed adequate potassium, an estimated 100K lives and \$12B in annual healthcare costs would be saved. Potato, already a high-potassium food, is well positioned to make a substantial contribution through genetic improvement. NRSP-6, as the world's most diverse and available source of new genes and germplasm information, is best positioned to support such contributions.

Beyond providing stocks, NRSP-6 staff members are involved in discovering and developing associated germplasm tools and information. Among these are self compatibility, gibberellin, and 2n gamete mutants; cut-stem pollination, hormone pre-treatment of seeds for better germination, haploid-extracting pollinators, and 2n gamete breeding technique. Yukon Gold, one of the most popular and name-recognized tablestock cultivars, has *S. phureja* 195198, an exotic cultivated species from NRSP-6 as a grandparent, and was bred using the 2n gamete technique.

Evaluation for a wide variety of useful traits has also been designed, contracted and documented by staff. Such work is the foundation for deploying exotic genes in new cultivars. One recent example is the release of cultivar PA99N82-4 bred with the Mexican wild species *S. bulbocastanum* from NRSP-6. It has high resistance to nematodes that can only be controlled by fumigation at an estimated cost of \$20M per year, not counting the “cost” in risks to human and environmental health posed by use of toxic chemicals.

The genebank goal is maximum diversity. But because funds for collecting, preserving, distributing and evaluating are limited, reaching that goal depends on maximizing efficiency through quality control and technology R&D. Thus, we collaborate with other world genebanks to study the partitioning and vulnerability of diversity in our collections. Examples of impact of this area are the intergenebank potato database, identification of more diversity-intense sites for future collecting, and confirming that the rare alleles within some populations within certain species are not explained by introgression of alleles common in another sympatric species.

One way the overall impact of these contributions can be measured is by the occurrence of NRSP-6 germplasm in the pedigrees of new, improved potato cultivars. About 70% of all potatoes grown in the United States have germplasm from the genebank in their pedigrees. Both cultivar releases published in the American Journal of Potato Research in 2008, ‘Premier Russet’ and ‘Dakota Diamond’, have exotic species from NRSP-6 in their pedigrees. The great-grandmother of the latter is *S. chacoense* 472812, a wild potato species originally collected in Argentina.

Another gauge of impact is in the numerous publications in 2008 providing information that pushes potato science forward. Section 6 lists 37 papers, 85 abstracts, and 4 theses which report the results of studies associated with NRSP-6 *Solanum* stocks this year.

The impact of the genebank is expected to increase in the future for several reasons. 1) Mutants discovered and characterized by staff will be increasingly valuable as research models. 2) Intragenic transformation of potato has now been demonstrated and identified as a kind of GMO much more accepted by the consumer, so useful exotic potato genes will be increasingly valuable as the technology to easily insert them into existing cultivars improves. 3) Potato is rapidly expanding in large new growing regions, so the need for genetic resources for breeding in new environments and for new tastes will surge. 4) Loss of wild habitats and other limits on collecting will make it even more important to understand how to efficiently keep what we already have—thus, enhancing the importance of in-house R&D on the partitioning and vulnerability of diversity. 5) The revolution in electronic information exchange gives NRSP-6 an opportunity to provide more complete and timely germplasm data, advice, and stocks, and detect and develop opportunities for new traits and germplasm applications. 6) Potato genetic resources will be increasingly mined for nutritional traits that reduce healthcare costs and suffering as evaluation and breeding technology advances.

5. WORK PLANNED FOR 2009

Fast and accurate delivery of high quality germplasm and information will continue to be the general objective of NRSP-6. We also aim to raise awareness of the germplasm resource through an advertising/outreach program, and by conducting and publishing research that demonstrates new ways the germplasm can be useful for potato improvement. It will be a goal to perform 250 successful seed increases in the upcoming year.

Evaluation experiments will continue on *Solanum* species for these and other traits: antioxidants, tuber acidity, tuber potassium, frost hardiness, tuber calcium, hormone mutants and anti-cancer compounds.

APIC Intergenebank projects, such as researching the status and dynamics of genetic diversity using DNA markers, will strengthen ties with sister genebanks around the world. Specifically, ongoing joint studies on tuber calcium, frost hardiness, and impact of agrichemicals on reproduction of wild potato populations will continue.

Our plan is to move toward consolidation of R&D into a single major project that encompasses most of our priority goals: Intergenebank cooperation, detection of how diversity is partitioned and how it is vulnerable, evaluation for useful traits, and emphasis on evaluation for consumer-oriented traits. These activities will center on *S. microdontum*, outstanding as a species with extreme and variable expression for many potentially useful traits (pH, potassium, calcium, late blight and soft rot resistance, reproductive mutants, high protein and antioxidants), while being relatively easy to grow

and introgress into *S. tuberosum*. This is the “MMP” = *microdontum multifaceted project*. A multifaceted approach should be more efficient, since multiple evaluations can be done on tubers from one growout, and interactions between traits can be detected.

We intend to conduct a collecting expedition for native wild potatoes in the Santa Catalina Mountains near Tucson, Arizona.

6. PUBLICATIONS ISSUED DURING THE YEAR 2008

A. Publications issued by NRSP-6 Personnel

- Alvarez, N.M.B., I.E. Peralta, A. Salas, and D.M. Spooner. 2008. A morphological study of species boundaries of the wild potato *Solanum brevicaulle* complex: replicated field trials in Peru. *Pl Syst Evol* 274:37-45.
- Ames, M. and D.M. Spooner. 2008. DNA from herbarium specimens settles a controversy about origins of the European potato. *Am J Bot* 95(2):252-257. (Additional supplemental data)
- Ames, M., A. Salas and D.M. Spooner. 2008. A morphometric study of species boundaries of the wild potato *Solanum* series *Piurana* (Solanaceae) and putatively related species from seven other series in *Solanum* sect. *Petota*. *Syst Bot* 33:566-578.
- Bamberg, J.B. 2008. Genetic comparisons of gibberellin mutants in potato. *Am J Potato Res* 85:2. (Abstract)
- Bamberg, John and Alfonso H. del Rio. 2008. Proximity and introgression of other potato species does not explain genetic dissimilarity between *Solanum verrucosum* populations of Northern and Southern Mexico. *Am J Potato Res* 85:232-238.
- Bamberg, J.B., C.J. Fernandez, M.W. Martin, and J.J. Pavek. 2008. Tuber dormancy lasting eight years in the wild potato *Solanum jamesii*. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Bamberg, J.B., M.W. Martin and J.P. Palta. 2008. Variation in *Solanum* species' tuber potassium accumulation and its implication for human nutrition. *Am J Potato Res* 85:2. (Abstract)
- Belmar-Diaz, C., H. Lozoya-Saldana, M. Salgado, and J. Bamberg. 2008. *Phytophthora infestans*: races and genotypes in Toluca, Mexico. A two-year update. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Del Rio, A.H. and J.B. Bamberg. 2008. Unbalanced bulk of parent's seed is not detrimental in potato germplasm regeneration. *Am J Potato Res* 85:28. (Abstract)
- Del Rio, A.H., J.B. Bamberg, C. Fernandez, and C. Zorrilla. 2008. Update on the comparative assessment of genetic diversity between accessible and remote potato populations: AFLP analysis of wild potato *Solanum stoloniferum* (formerly *S. fendleri*) distributed in SW regions of the USA. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)

- Fajardo, D., R. Castillo, A Salas, and D.M. Spooner. 2008. A morphometric study of species boundaries of the wild potato *Solanum* series *Conicibaccata*: a replicated field trial in Andean Peru. *Syst Bot* 33:183-192.
- Hale, Anna L., Lavanya Reddivari, M. Ndambe Nzaramba, John B. Bamberg, and J. Creighton Miller, Jr. 2008. Interspecific variability for antioxidant activity and phenolic content among *Solanum* species. *Am J Potato Res* 85:332-341.
- Jansky, S.H., R. Simon and D.M. Spooner. 2008. A test of taxonomic predictivity: resistance to early blight in wild relatives of cultivated potato. *Phytopath* 98:680-687.
- Jimenez, J.P., A. Brenes, A. Salas, D. Fajardo, and D.M. Spooner. 2008. The use and limits of AFLP data in the taxonomy of polyploid wild potato species in *Solanum* series *Conicibaccata*. *Conserv Genet* 9:381-387.
- Nzaramba, M.N., L. Reddivari, J.B. Bamberg, and J.C. Miller Jr. 2008. Phenolic and glycoalkaloid levels of *S. jamesii* accessions and their anti-proliferative effect on human prostate and colon cancer cells *in vitro*. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Palta, J.P., J.B. Bamberg and S.E. Vega. 2008. Moving frost hardy genes from wild to cultivated potatoes. Use of precise screening tools to make real progress. *Am J Potato Res* 85:23. (Abstract)
- Palta, J.P., J.B. Bamberg and S.E. Vega. 2008. Freezing tolerance of cultivated potatoes: Moving frost hardy genes from wild potatoes and making real progress using precise screening tools. ASHS 2008 Conference, Orlando, Florida. *HortSci* 43:1108. (Abstract)
- Palta, J.P., J.B. Bamberg, S.E. Vega, F.M. Navarro, and B. Bowen. 2008. Genetic improvement of potato for tuber calcium uptake. *Proceedings of Annual Wisconsin Potato Meetings* 21:15-20.
- Palta, J.P., R. Gomez, A.H. del Rio, W. Roca, J.B. Bamberg, A. Salas, and M. Bonierbale. 2008. Supplemental calcium nutrition may have the potential of improving tuber yield of native potatoes in the Peruvian highlands. *Am J Potato Res* 85:23. (Abstract)
- Palta, J.P., F.M. Navarro, J.B. Bamberg, S.E. Vega, and B. Bowen. 2008. The Calcium Solution: Developing potato cultivars with enhanced tuber storage and internal quality by genetic improvement of tuber calcium accumulation ability. *The Badger Common 'Tater* 60:14-16.
- Pendinen G., T. Gavrilenko, J. Jiang, and D.M. Spooner. 2008. Allopolyploid speciation of the Mexican tetraploid potato species *Solanum stoloniferum* and *S. hjertingii* revealed by genomic in situ hybridization. *Genome* 51:714-720.
- Peralta, I.E., D.M. Spooner and S. Knapp. 2008. The taxonomy of tomatoes: a revision of wild tomatoes (*Solanum* section *Lycopersicon*) and their outgroup relatives in sections *Juglandifolium* and *Lycopersicoides*. *Syst Bot Monogr* 84:1-186+3 plates.
- Spooner, D.M., D. Fajardo and A. Salas. 2008. Revision of the *Solanum medians* complex (*Solanum* sect. *Petota*). *Syst Bot*:33:579-588.

Spooner, D.M., F. Rodriguez, Z. Polgar, H.E. Ballard Jr., and S.H. Jansky. 2008. Genomic origins of potato polyploids: GBSSI gene sequencing data. *The PI Genome*, a Suppl. to *Crop Sci.* 48(S1):S27-S36.

B. Journal Articles and Abstracts Reporting Research with NRSP-6 Stocks

Almasia, N.I., A.A. Bazzini, H.E. Hopp, and C. Vazquez-Rovere. 2008. Over expression of *snakin-1* gene enhances resistance to *Rhizoctonia solani* and *Erwinia carotovora* in transgenic potato plants. *Mol Pl Path* 9(3):329-338. (Abstract)

Arvin, M.J. and D.J. Donnelly. 2008. Screening potato cultivars and wild species to abiotic stresses using an electrolyte leakage bioassay. *J Ag Sci Tech* 10(1):33-42. (Abstract)

Aversano, R., M.R. Ercolano, L. Frusciante, L. Monti, J.M. Bradeen, G. Cristinzio, A. Zoina, N. Greco, S. Vitale, and D. Carputo. 2007. Resistance traits and AFLP characterization of diploid primitive tuber-bearing potatoes. *Genet Res Cr Evol* 54(8):1797-1806. (Abstract)

Ballou, S.M., K.Y. Yun, C. Cheng, and B.G. de los Reyes. 2007. Cold sensitivity gradient in tuber-bearing *Solanum* based on physiological and transcript profiles. *Crop Sci* 47(5):2027-2035. (Abstract)

Bhaskar, P.B., J.A. Raasch, L.C. Kramer, P. Neumann, S.M. Wielgus, S. Austin-Phillips, and J.M. Jiang. 2008. *Sgt1*, but not *Rar1*, is essential for the *RB*-mediated broad-spectrum resistance to potato late blight. *BMC Pl Bio* 8(8). (Abstract)

Bidani, A., O. Nouri-Ellouz, L. Lakhoua, D. Sihachakr, C. Cheniclet, A. Mahjoub, N. Drira, and R. Gargouri-Bouزيد. 2007. Interspecific potato somatic hybrids between *Solanum berthaultii* and *Solanum tuberosum* L. showed recombinant plastome and improved tolerance to salinity. *Pl Cell, Tissue & Organ Culture* 91(3):179-189. (Abstract)

Bradeen, J.M., M. Iorizzo, H. Mann, L. Gao, E.A. Quirin, R. Aversano, and D. Carputo. 2008. Comparative structural genomics of 1EBN potato: DArT markers for improved access to resistance genes. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)

Brown, C.R. 2008. Breeding for phytonutrient enhancement of potato. *Am J Potato Res* 85:298-307.

Brown, C.R., D. Culley, M. Bonierbale, and W. Amoros. 2007. Anthocyanin, Carotenoid content, and antioxidant values in native South American potato cultivars. *HortSci* 42(7):1733-1736. (Abstract)

Brown, C.R., M. Moore, M. Pavék, D. Hane, R. Novy, J.C. Miller Jr., S.L. Love, and S. James. 2008. Genetic variability in mineral content of potato tubers. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)

Burkhart, C.R., B.J. Christ, K.G. Haynes, and B.T. Vinyard. 2008. Little genetic and no additive genetic variance for resistance to common scab in a *Solanum phureja*-*S. stenotomum* population. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Poster)

- Camadro, E.L., S.K. Saffarano, J.C. Espinillo, M. Castro, and P.W. Simon. 2008. Cytological mechanisms of 2n pollen formation in the wild potato *Solanum okadae* and pollen-pistil relations with the cultivated potato, *Solanum tuberosum*. *Genet Res Crop Evol* 55(3):471-477. (Abstract)
- Campbell, B.A., J. Hallengren and D.J. Hannapel. 2008. Accumulation of BEL1-like transcripts in solanaceous species. *Planta* 228:897-906.
- Cernak, I., J. Taller, I. Wolf, E. Feher, G. Babinszky, Z. Alfoldi, G. Csanadi, and Z. Polgar. 2008. Analysis of the applicability of molecular markers linked to the PVY extreme resistance gene *Ry_{sto}*, and the identification of new markers. *Acta Bio Hungarica* 59(2):195-203. (Abstract)
- Chatterjee, M., A.K. Banerjee and D.J. Hannapel. 2007. A *BELLI*-like gene of potato is light activated and would inducible. *Pl Physio* 145(4):1435-1443. (Abstract)
- Cheng, ShanHan, Xie CongHua, Lin ShiSen et al. 2006. Germplasm enhancement and breeding to resist low temperature sweetening in potato. *China Vegetables* pp 84-88. (Abstract)
- Coleman, W.K. 2008. Evaluation of wild *Solanum* species for drought resistance: 1. *Solanum gandarillasii* Cardenas. *Environ Exp Bot* 62(3):221-230. (Abstract)
- D'hoop, B.B. 2008. Association mapping in tetraploid potato using SSRs and AFLPS. In: 17th Triennial Conference of the EAPR, Abstracts of papers and posters, Brasov, Romania, July 6-10, 2008, p. 376. (Abstract)
- D'hoop, B.B., M.J. Paulo, K. Kowitwanich, R.G.F. Visser, H.J. van Eck, and F.A. van Eeuwijk. 2008. Association mapping in tetraploid potato using SSRs and AFLPs. In: Molecular mapping and marker assisted selection in plants, Programme and abstracts, Vienna, Austria, February 03-06, 2008, p. 88. (Abstract)
- Douches, D., J. Coombs, J. Estelle, D. Berry, K. Zarka, W. Kirk, and R. Schafer. 2008. Update on late blight resistance breeding in Michigan. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Drobyszina, P. and E. Khavkin. 2008. Two *CONSTANS-LIKE1* genes in long- and short-day *Solanum* plants. XVI FESPB Congress, Tampere, Finland, 2008. *Physiol Pl* 133:10-20. (Abstract)
- Drobyszina, P.E. and E.E. Khavkin. 2008. Two *CONSTANS-LIKE* genes in *Solanum* plants. Control of flowering time and application for plant breeding. Science meeting, Salzau, German, September 2008, p 35. (Abstract)
- Fry, W. 2008. *Phytophthora infestans*: the plant (and *R* gene) destroyer. *Mol Pl Path* 9(3):385-402. (Abstract)
- Ginzberg, I., J. Tokuhisa and R.E. Veilleux. 2008. Potato steroidal glycoalkaloids: Biosynthesis and genetic manipulation. *Potato Res* 52:0014-3065 (Print) 1871-4528 (Online).
- Gokce, A., M.E. Whalon, H. Cam, Y. Yanar, I. Demirtas, and N. Goren. 2007. Contact and residual toxicities of 30 plant extracts to Colorado potato beetle larvae. *Archives Phyto Pl Prot* 40(6):441-450. (Abstract)

- Gonzalez-Schain, N.D. and P. Suarez-Lopez. 2008. CONSTANS delays flowering and affects tuber yield in potato. *Bio Plant* 52(2):251-258. (Abstract)
- Govers, F. and H.J.G. Meijer. 2007. *Phytophthora* genomics: new opportunities and challenges. *Gewasbescherming* 38(5):265-271. (Abstract)
- Greco, N., A. Brandonisio, and P. de Cosmis. 2007. Pathotypes and heterogeneity of Italian populations of *Globodera rostochiensis* and *G. pallida*. *Nematol Mediterranea* 35(2):137-142. (Abstract)
- Halterman, D., Z. Liu, Y. Chen, and S. Stephenson. 2008. Molecular characterization of potato disease resistance genes. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Halterman, D.A., L.C. Kramer, S. Wielgus, and J.M. Jiang. 2008. Performance of transgenic potato containing the late blight resistance gene *RB*. *Pl Disease* 92(3):339-343. (Abstract)
- Hannapel, D.J., M. Chatterjee, Y.Y. Yu, H. Chen, and A.K. Banerjee. 2008. A light-activated signal for tuberization. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Haynes, Kathleen G. 2008. Heritability of chip color and specific gravity in a long-day adapted *Solanum phureja*-*S. stenotomum* population. *Am J Potato Res* 85:361-366.
- Haynes, K.G., B.J. Christ and B.T. Vinyard. 2008. Determining the importance of combining ability for late blight resistance in early generations of potato breeding when susceptible clones are discarded. *Am J Potato Res* 85:445-454.
- Heldak, J., M. Bezo, V. Stefunova, and A. Gallikova. 2007. Selection of DNA markers for detection of extreme resistance to potato virus *Y* in tetraploid potato (*Solanum tuberosum* L.) F₁ progenies. *Czech J Genet Pl Breed* 43(4):125-134. (Abstract)
- Hermanova, V., J. Barta and V. Curn. 2007. Wild potato species: Characterization and biological potential for potato breeding. *Czech J Genet Pl Br* 43(3):73-81. (Abstract)
- Horgan, F.G., D.T. Quiring, A. Lagnaoui, and Y. Pelletier. 2007. Variable responses of tuber moth to the leaf trichomes of wild potatoes. *Ent Exp Appl* 125(1):1-12. (Abstract)
- Horgan, F.G., D.T. Quiring, A. Lagnaoui, A.R. Salas, and Y. Pelletier. 2007. Periderm- and cortex-based resistance to tuber-feeding *Phthorimaea operculella* in two wild potato species. *Ent Exp Appl* 125(3):249-258. (Abstract)
- Houser, A.J. and R. Davidson. 2008. Development of a greenhouse assay to evaluate potato germplasm for susceptibility to powdery scab. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Jacobs, M.M.J., R.G. van den Berg, V.G.A.A. Vleeshouwers, M. Visser, R. Mank, M. Sengers, R. Hoekstra, and B. Vosman. 2008. AFLP analysis reveals a lack of phylogenetic structure with *Solanum* section *Petota*. *BMC Evol Bio* 88(145). (Abstract)

- Jansky, S.H., A.J. Hamernik and J. Bae. 2008. The use of *Solanum verrucosum* to access 2x, 1EBN germplasm. 92nd Annual Meeting of The PAA, Buffalo, NY, August 10-14, 2008. (Abstract)
- Jolivet, K., E. Grenier, J.P. Bouchet, M. Esquibet, M.C. Kerlan, B. Caromel, D. Mugniery, and V. Lefebvre. 2007. Identification of plant genes regulated in resistant potato *Solanum sparsipilum* during the early stages of infection by *Globodera pallida*. *Genome* 50(4):422-427. (Abstract)
- Kielbowicz-Matuk, Agnieszka, Pascal Rey and Tadeusz Rorat. 2008. The organ-dependent abundance of a *Solanum* lipid transfer protein is up-regulated upon osmotic constraints and associated with cold acclimation ability. *J Exp Bot*, 4/25/2008, pp 1-13.
- Lang, ZhiHong, Zhou Peng, Yu JingJuan, Ao GuangMing, and Zhao Qian. 2008. Functional characterization of the pollen-specific *SBgLR* promoter from potato (*Solanum tuberosum* L.). *Planta* 227(2):387-396. (Abstract)
- Le Roux, V., E.Campan, F. Dubois, C. Vincent, and P Giordanengo. 2007. Screening for resistance against *Myzus persicae* and *Macrosiphum euphorbiae* among wild *Solanum*. *Ann. Appl. Biol.* 151:83-88.
- Le Roux, V., S. Dugravot, E.Campan, F. Dubois, C. Vincent, and P Giordanengo. 2008. Wild *Solanum* Resistance to Aphids: Antixenosis or Antibiosis? *J. of Econ. Entomol.* 101 (2): 584-591
- Liu, XiCai. 2006. Study and utilization of potato germplasm resources. *China Vegetables* pp 25-27. (Abstract)
- Love, S.L. and J.J. Pavek. 2008. Positioning the potato as a primary food source of vitamin C. *Am J Potato Res* 85:277-285.
- Luthra, S.K., J. Gopal, V. Kumar, B.P. Singh, and S.K. Pandey. 2008. Evaluation of potato germplasm for frost tolerance. *Indian J Hort* 65(3):344-346. (Abstract)
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7. **APPROVED**

D. S. Douches, Chairman, Technical Committee

Date

C. Y. Hu , Lead Administrative Advisor

Date