

Curriculum vitae

Of

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Education:

Institution & Location	Degree	Date	Discipline	
			Major	Minor
Punjab Agri University Ludhiana, India	B.S.	1966	Agriculture	
Punjab Agri University Hissar, India	M.S.	1968	Soil Physics	Phys Chem
University of Minnesota St. Paul, MN	M.S.	1971	Soil Physics	Plant Physiol
University of Minnesota St. Paul, MN	Ph.D.	1976	Plant Physiol.	

Professional Experience:

Academic

1991-Present	Professor, University of Wisconsin-Madison, Department of Horticulture.
1986-1991	Associate Professor, University of Wisconsin, Department of Horticulture.
1982-1986	Assistant Professor, University of Wisconsin, Department of Horticulture, Madison, WI
1981-1982	Adjunct Assistant Professor, University of Iowa, Botany Department, Iowa City.
1979-1981	Visiting Assistant Professor, University of Iowa, Botany Department, Iowa City.
1977-1979	Post-doctoral Research Associate, University of Minnesota, Horticulture Department, St. Paul, MN.
1969-1976	Research Assistant, University of Minnesota, Department of Soils and Department of Horticultural Science, St. Paul, MN.
1968-1969	Teaching Assistant, Punjab Agri. University, Hissar, India.

Other

Founder and Chief Technology Officer: Nutra Park, Inc. (2000 – 2004)

Started a company to commercialize University of Wisconsin (WARF) patented technology (see below patents).

Honors, Patents Received and Cultivars Released:

Honors

- 1999 Awarded Campbell-Bascom Distinguished Professorship UW Madison
- 2000 Most Outstanding Publication of the Year awarded by Amer. Soc. Hort. Sci.
- 2004 American Society of Horticultural Science, **Researcher of the Year Award**
- 2006 American Society of Horticultural Science, **Elected Fellow**
- 2007/08 Elected Chair of the Physiology Section of the Potato Association of America
- 2007/09 Appointed on the Executive Committee of the Potato Assoc. Amer.
- 2009/10 Elected Chair of the Breeding and Genetic Section of the Potato Assoc. Amer.
- 2010 **USDA/ARS Medal** to deliver Morrison Memorial Lecture at the Annual Conference of the Amer. Soc. Hort. Sci.
- 2010 **Keynote Speaker** at the Inter. Symposium on the Agronomy and Physiology by the European Association for Potato Research
- 2011 **Elected Fellow** of the Crop Society of India
- 2012 **Life Time Achievement Award** by the Potato Association of America
- 2013 Invited to Hokkaido, Japan to give series of talks to the potato growers on calcium nutrition and potato production
- 2014 **Keynote address** at the 10th International Plant Cold Hardiness Seminar held at Poznan Poland
- 2015 Invited talks at Obihiro University Japan on calcium nutrition of potato and abiotic stress mechanisms
- 2016 Invited talks to potato growers on calcium nutrition and abiotic stress Alberta, Canada
- 2016 Researcher of the Year Award given by the Wisconsin Potato and Vegetable Growers Association
- 2018 Organized, chaired, and hosted the 11th International Conference on Plant Cold Hardiness in Madison, WI.

Patents

1. Plant and Fruit treatment with lysophosphatidylethanolamine: Pre-harvest application.
US Patent #5,110,541 issued on May 5, 1992.
2. Plant and Fruit treatment with lysophosphatidylethanolamine: Post-harvest application
US Patent #5,126,155 issued on June 30, 1992.
3. Use of LPE 18:1 and LPI to enhance fruit ripening and storage of plant material
US Patent #6,426,105 issued Sept. 2002
4. Method for enhancing plant health, protecting plants from biotic and abiotic stress related injuries and enhancing the recovery of plants injured as result of such stress.
US Patent issued June 2003

5. Method for enhancing plant health, protecting plants from biotic and abiotic stress related injuries and enhancing the recovery of plants injured as result of such stress (plant seeds).

US Patent # 7,101,828 issued September 5, 2006

Cultivars Released

Based on the strategies developed in Palta's research program Vilmorin, a European seed company **released two frost hardy carrot hybrids (Arctico, Eskimo) that are being commercialized in Europe.**

Palta was director of the Wisconsin Potato Breeding Program 2004-2014. Based on his effort the following potato varieties have been released. At present over 500 acres of seed of these varieties were planted in the US for sale.

Year	Name/clone number	Use
2018	Red Prairie	Fresh market red
2017	W9133-1RUS	Russet (fresh)
2016	W8893-1R	Fresh market red
2015	W6609-3	Chip processing
2015	Hodag (W5955-1)	Chip processing
2014	Red Endeavor	Fresh market red
2014	Oneida Gold	Fresh market yellow
2013	Pinnacle	Chip processing
2012	Lelah	Chip processing
2010	Accumulator	Chip processing
2010	Nicolet	Chip processing

Research

(I) Summary of Palta's Research Contributions and Their Significance

Over the last 35 years Palta has conducted pioneering and innovative research. His **research has spanned from molecular and cellular levels to whole plant and field studies.** Palta has made landmark research contributions in the areas of plant cold hardiness, plant cell membrane functions especially in relation to environmental stresses, potato tuber quality in relation to calcium nutrition, fruit ripening and senescence including shelf life of food crops. He has been a **leader in the area of cold hardiness research.** Not only has his work led to the understanding of mechanism of freezing injury and cold acclimation but also has had major implications in breeding hardy cultivars. **Work in the area of calcium nutrition of potato has led to development of several commercial products currently used by most of the potato growers in Wisconsin and a significant industry in Idaho, Washington, Canada, Australia and Mexico. Patented technology developed by Palta on natural lipids has tremendous potential impact on the shelf life and quality of fruits and vegetables and is being commercialized.**

In recognition of his outstanding contribution to research and its impact on horticultural industry, Palta was awarded the **Researcher of the Year award in 2004** by the American Society of Horticultural Science. He was **elected fellow of this society in 2006**. He was given **USDA Medal in 2010** and **Life Time Achievement Award by the Potato Association of America in 2012**

His publication record includes over 150 refereed publications and international conference proceedings, 70 grower conference proceedings and grower magazine articles and over 330 printed abstracts.

Under his supervision, **13 MS and 17 PhD** degrees have been granted. During this period **15 Post Doctoral** individuals have worked in his program.

He has made **60 invited presentations at international symposia** and conferences and 70 presentations at the potato and cranberry growers meetings and conferences. In addition to being **a lead speaker** he was invited to participate in the **organization of several prestigious symposia** such as **Gordon Research Conferences, NATO conferences, Int. Plant Cold Hardiness Symposia and American Soc. Hort. Sci. and Int. Soc. Hort. Sci. symposia and Potato Association of America Symposium.**

To support his research program Palta has obtained several **highly competitive federal grants such as USDA, DOE** (Department of Energy), as well as grants from the various industries including potato and cranberry growers associations

Following are the highlights of Palta`s research contributions:

1. ***Mechanism of injury by freeze-thaw stress at the cellular and membrane levels***: Palta is widely recognized for his work on the mechanism of injury by freeze-thaw stress at cellular and membrane levels. Palta and his co-workers were **the first researchers to propose and later demonstrate alteration of the functions of plasma membrane ATPase as a primary site of freezing injury**; first to provide evidence that injury is reversible and that recovery from injury is associated with recovery of the function of the plasma membrane ATPase. This work remains central to the field of cold hardiness research today and has opened new avenues for investigating mechanisms of freezing injury and cold acclimation in herbaceous plants.
2. ***Perturbation of membrane and cellular calcium as a critical event in freezing injury***: Palta`s group was the first to demonstrate perturbation of membrane and cellular calcium as a plant response to low temperature stress. They showed that a specific loss of membrane calcium occurs during the early stages of injury. His findings are also currently **being used to explain enhanced winter injury in natural forests exposed to acid rain** (resulting in calcium loss). Based on the fact that calcium acts as a secondary messenger in both plants and animal systems, Palta`s calcium research was expanded by others to understand signal transduction in plants during exposure to low temperature. Palta`s findings also appear to have **practical implications** since recently his research group demonstrated that plant protection from natural frosts was enhanced by supplemental soil calcium applications.

3. ***Mechanism of cold adaptation in plants***: Cultivated potatoes are very frost sensitive and do not adapt (acclimate) to cold. However, some wild potatoes (with poor tuber quality and yield) are frost tolerant and able to cold acclimate. About 10 years ago, using wild and cultivated potatoes that vary in freezing tolerance and cold acclimation ability, Palta initiated a project on understanding genetics of cold hardiness and investigate the potential for producing frost hardy cultivated potatoes. He and his co-workers synthesized *Solanum* populations segregating for cold response. By precise evaluation of these populations **they demonstrated independent genetic control of the two major components of cold hardiness, namely nonacclimated freezing tolerance and capability to cold acclimate. This work, published in the Proc. Natl. Acad. Sci., has been verified in woody species as well as in overwintering agronomic crops and had major implications in breeding for enhanced frost and winter survival.** Based on this work, it has now become clear that different components of frost and winter survival can be independently selected and recombined to get a desired plant. Furthermore, these studies have demonstrated that real progress in breeding for cold hardiness can be made by precise screening tools geared to each component of frost and winter hardiness.
4. ***Calcium nutrition and potato tuber quality***: Palta's research in the area of influence of calcium nutrition on potato tuber quality and yield has led to the **development of a new concept in potato tuber nutrition.** This work began a decade ago when Palta and his graduate student **discovered that potato tubers have tiny roots that provide nutrients such as calcium to the tubers.** This **discovery has changed the way scientists think about potato tuber nutrition.** Before this work was published, it was generally assumed that tubers derive all their nutrition from the mother plant. Palta's result showed that tuber is able to derive nutrients (such as calcium) from soil directly. Palta's finding has had **major implications on the timing and placement of calcium fertilizer.** Improved calcium concentration in tubers means **less internal defects (improved tuber quality) and improved storability.** This research has already benefited Wisconsin potato growers and has generated tremendous interest among potato growers everywhere. **Three commercial liquid calcium products resulted from Palta's research and are being sold to the potato growers in the US, Canada, Australia and Mexico.** More recently he and his graduate student have provided evidence that the **adverse impact of heat stress on the potato plant can be mitigated by nitrogen and calcium nutrition** during stress. Potatoes do not do well under the heat stress. Palta's findings have a **major implication for potato production in warm climates.** One of his former graduate student is currently applying this work to produce potatoes in Egypt. From a simple observation of tiny roots on potato tubers he demonstrated not only the basic mechanism of tuber nutrient uptake but he provided practical solution to improve potato quality and yield especially for sandy soils.
5. ***Potato Breeding and Genetics***: Palta has served as the leader of the Wisconsin Potato Breeding Program since 2005. **Four potato varieties have been named and released during this time.** Three of these (Tundra, Nicolet and Lelah) have better cold storage quality as compared to the current standard cultivar Snowden. The fourth (Accumulator) is the highest yielding potato variety suitable producing chips without cold storage. Five PVP have been obtained thru the Wisconsin Alumni Research Foundation (WARF) on newly released varieties. Additionally, 13 elite lines have been disclosed to WARF for protection and licensing. The newly released varieties have been aggressively promoted. The seed acres planted of these varieties have tripled, from 180 to 600 acres, since 2005. Expertise in environmental stress physiology and potato tuber quality in relation to calcium nutrition is being integrated into the

potato breeding project. These efforts have led to a nationally recognized potato breeding program aimed at improving tuber quality and plant performance under abiotic stresses.

Palta initiated a new effort aimed at breeding for improved tuber internal quality. In collaboration with John Bamberg, Palta's program demonstrated that tuber calcium content is a heritable trait. This research has led to a new approach in genetically improving potato tuber quality by increasing tuber calcium uptake. A federally funded competitive grant (USDA-NIFA) has been obtained to understand genetics of tuber calcium uptake and develop molecular markers to select for improved tuber quality. A unique population segregating for tuber calcium and tuber quality developed by Palta's group has been genotyped by SolCap to develop molecular markers for potato quality traits. His PhD student, Cinthya Zorilla is in the evaluating these data.

Palta's program made significant advances in breeding for frost tolerance of potato. Cultivated potatoes are very frost sensitive and do not adapt (acclimate) to cold. However, some wild potatoes are known to be frost tolerant and able to cold acclimate. Comparative biochemical studies conducted in Palta's program demonstrated that these wild potato species turn on a desaturase (Δ -9 desaturase gene) during cold acclimation to acquire frost tolerance. This gene is not induced in the cultivated potatoes. This gene has been now cloned from several wild potato species. His recent research has identified several unique SNPs associated with this gene in the cold hardy wild potato species *Solanum commersonii*. Using a segregating population his group is now developing and validating molecular markers that can be used to screen for frost tolerance. Field trials with hardy clones developed by Palta and Bamberg are being conducted in the Peruvian Highlands.

A strategy developed by Palta's program led to the release of a frost tolerance carrot inbred. Early research conducted in his program demonstrated that frost hardy carrots could be developed by independently selecting carrot roots for freezing avoidance and carrot top for frost tolerance. From this research, he developed a strategy that these two traits could be combined to get a desired commercially viable frost hardy carrot. This work was pursued by Vilmorin (French seed company) and they released a frost hardy inbred, Eskimo, in 2003. This cultivar has performed well in north European countries under frost conditions. Last year, Eskimo was awarded the 2011 NIAB (UK) variety cup. This award annually recognizes one variety among all crops, including field crops.

- 6. *Developing a simple, affordable and locally available technology to improve production of native potatoes in the Peruvian Highlands:*** In the past six years he, along with Bamberg and Alfonso DelRio, has worked with subsistence farming communities in the Peruvian highlands that grow indigenous potatoes. In these areas the potatoes are manually cultivated using the old tools from the Incas. To offset potential crop losses by pests and/or environmental stresses, every growing season farmers plant hundreds of different local varieties. These varieties are very diverse in forms, colors and flavors as they were selected for those traits and, are adapted to the harsh conditions that exist in the high Andes. However, tuber yields and tuber quality for these varieties are poor in general. Palta's studies have demonstrated that the yield of native potatoes can be increased up to two folds by incorporating gypsum at the time of planting. These studies are being conducted with the co-operation of the International Potato Center (CIP). This work is currently funded by an USAID grant through CIP.

7. ***Discovery of novel lipids as bioregulators: Accelerate fruit ripening and improve shelf life:*** Cranberry fruit ripens in late fall when the crop is subjected to frost daily. Wisconsin growers are, therefore, forced to harvest less than ripe fruits. Unripe fruit means less natural color and flavor and thus less economic yield. Palta has addressed this problem in two ways. First, working both in the field and in controlled environmental conditions Palta has developed information for managing this crop during the frost episodes and during winter months. An important and unique **extension bulletin on this subject has been published and widely distributed by Palta's program**. Second, Palta initiated a project with the support from the cranberry industry on accelerating fruit ripening by using environmentally safe products. During this research he and his graduate student **discovered that a natural lipid lysophosphatidyl-ethanolamine (LPE) is not only able to accelerate ripening of cranberry but also prolong shelf life during storage**. LPE has now been shown to be effective in wide variety of fruits as well as in prolonging shelf life of cut flowers. Some of his research was featured on the cover of HortScience in 1997. **Based on this work Wisconsin Alumni Research Foundation (WARF) has obtained four patents.**

Although exact mechanisms by which LPE modulates fruit ripening and retards senescence is not known, Palta and co-workers have shown that LPE can regulate ethylene production and respiration in plant tissues. Later Palta and his coworkers **demonstrated that LPE is able to modulate phospholipase D (a key enzyme activated during senescence) in a highly specific manner**. This work, which **appeared in the Proc. Natl. Acad. Sci.** has provided evidence that LPE acts as a lipid derived novel growth regulator. This work has opened new opportunities to the understanding and manipulating of senescence in plants. Lysophospholipids such as LPE are generated by the action of an enzyme phospholipase A2 (PLA 2) *in vivo*. In a recent collaborative (**Plant Cell 2003**) study a PLA2 gene was isolated from Arabidopsis and **study of the transgenic plants provided evidence the interaction of these lipids with the plant hormone auxin**. This research is shedding light on mechanisms by which these lipids modulate plant growth and development.

(II) Invited Talks at National/International Symposia

1. INTERNATIONAL SOCIETY FOR CRYOBIOLOGY. (Minneapolis, MN, August 1977). Title: Plant viability assay. A manuscript was published in the proceedings of the symposium in Cryobiology.
2. INTERNATIONAL SYMPOSIUM ON PLANT COLD HARDINESS. (St. Paul, MN, November 1977). Title: Cell membrane properties in relation to freezing injury. A manuscript was published in the proceedings of the symposium, published by Academic Press.
3. U.S. JAPAN SYMPOSIUM ON COLD HARDINESS. (Sapporo, Japan, August 1981)
Title: Cell membrane alterations following a slow freeze-thaw cycle: Ion leakage,

injury and recovery. A manuscript was published in the proceedings of the symposium, published by Academic Press.

4. GORDON CONFERENCE ON TEMPERATURE STRESS IN PLANTS. (Tilton, NH, June 1984) Title: Membrane transport parameters: An approach to study mechanisms of freezing injury and cold acclimation.
5. EUROPEAN SYMPOSIUM ON COLD HARDINESS. (Turku, Finland, August 1984) Title: In vivo study of membrane alterations following freezing injury and cold acclimation.
6. U.S. CHINA SYMPOSIUM ON COLD HARDINESS. (Shanghai Institute of Plant Physiology, Academia Sinica, Shanghai, China, August 1986). Helped in the organization of the symposium and in the editing of the conference proceedings. Title: Role of cell membranes in freezing injury and cold acclimation in herbaceous plants.
7. GORDON CONFERENCE ON TEMPERATURE STRESS PLANTS. (Santa Barbara, CA, January 1987). Discussion Leader (one session). Title: Mechanisms of freezing injury and cold acclimation at the membrane level.
8. NATO SYMPOSIUM ON BIOCHEMISTRY AND PHYSIOLOGY OF ENVIRONMENTAL STRESS IN PLANTS. (Norwich, England, August 1987). Chairman and organizer of the Low Temperature Stress Section. Title: Molecular mechanism of freezing injury and cold acclimation: Role of the plasma membrane.
9. AMER. SOC. HORT. SCI. SYMPOSIUM ON INTERRELATIONSHIPS AMONG ENVIRONMENTAL STRESSES. (East Lansing, Michigan, August 1988). Title: Interrelationships among temperature, water and osmotic stresses at the cellular and membrane level.
10. PLANT BIOCHEMISTRY AND PHYSIOLOGY SYMPOSIUM (University of Missouri, Columbia, April 1989). Title: Plasma membrane ATPase as a key site of alteration during cold acclimation and freezing injury.
11. SYMPOSIUM ON PLANT BREEDING IN THE 1990s. (North Carolina State University, Raleigh, NC, March 1991). Title: Mechanisms for obtaining high or low temperature tolerance.
12. PLANT COLD HARDINESS SEMINAR. (Uppsala, Sweden, July 1991) Title: Ice formation and freezing injury at organ and intact plant levels including supercooling and ice nucleation.
13. PLANT COLD HARDINESS SEMINAR. (Uppsala, Sweden, July 1991) Title: Breeding potential for improvement of freezing stress resistance: Genetic separation of freezing tolerance, freezing avoidance and capacity to acclimate.

14. INVITED BY THE POTATO ASSOCIATION OF AMERICA TO CONDUCT A SPECIAL SESSION. (Spokane, WA, August 1991) Title: Calcium nutrition and potato tuber quality.
15. NATO ADVANCED RESEARCH WORKSHOP "INTERACTING STRESSES ON PLANTS IN A CHANGING CLIMATE". (Kent, UK, September 1992) Title: Environmental factors that influence cold hardiness.
16. NATO ADVANCED RESEARCH WORKSHOP ON BIOCHEMICAL AND CELLULAR MECHANISM OF STRESS TOLERANCE IN PLANTS. (Maratea, Italy, June 1993). Title: Molecular mechanisms of freezing injury and cold acclimation in plants: Merging physiological and genetic approaches.
17. AMER. SOC. HORT. SCI. COLLOQUIUM ON RECENT ADVANCES IN PLANT RESPONSES TO STRESS: BRIDGING THE GAP BETWEEN SCIENCE AND TECHNOLOGY. (Corvallis, OR, August 1994).Title: Calcium and its role in plant stress.
18. GORDON CONFERENCE ON TEMPERATURE STRESS IN PLANTS. (Oxnard, CA, January 1995).Title: Sorting genes controlling freezing stress resistance: Strategy for moving desired traits by merging molecular, physiological and genetic approaches.
19. POTATO ASSOCIATION OF AMERICA SOCIETY ANNUAL SYMPOSIUM. (Bangor, Maine, 1995). Title: Improving potato tuber quality by calcium nutrition.
20. FIFTH INTERNATIONAL COLD HARDINESS SYMPOSIUM. (Corvallis, OR, August 1996). Title: Sorting genes for freezing tolerance: Merging genetic, molecular and physiological approaches.
21. WASHINGTON STATE ANNUAL POTATO GROWER'S MEETINGS. (Moses Lake, WA, 1997). Title: The calcium update: Impact of calcium nutrition on tuber quality and yield.
22. INTERNATIONAL SYMPOSIUM OF SUSTAINABLE AGRICULTURAL HILL AREAS. (Palampur, India, October 1998). Title 1: Improving frost hardiness and winter survival by merging molecular, physiological and genetic approaches. Title 2: Use of natural lipids to promote frost ripening and improve shelf life.
24. 14TH TRIENNIAL CONFERENCE OF THE EUROPEAN ASSOCIATION FOR POTATO RESEARCH. (Italy, May 1999). Title: Molecular mechanism of freezing injury and cold acclimation in potato.

25. NATIONAL POTATO CONFERENCE. (Mexico, 1999). Title: Impact of calcium nutrition on potato tuber quality.
26. GLOBAL CONFERENCE ON POTATO. (New Dehli, India, December 1999). Title: Impact of calcium nutrition on potato tuber quality.
27. INDIAN AGRICULTURAL RESEARCH INSTITUTE. (New Dehli, India, December 1999). Title: Discovery of potato tuber roots: From basic physiology to field production.
28. INTERNATIONAL PLANT GROWTH REGULATION SYMPOSIUM. (Seoul, Korea, 2001) Organized under International Society of Horticultural Science. Title: Natural lipids: A new class of plant growth regulators.
29. SEOUL NATIONAL UNIVERSITY. (Seoul, Korea 2001). Title: Manipulating fruit ripening and plant senescence by using a natural lipid LPE.
30. CANADIAN VEGETABLE AND FRUIT GROWERS CONFERENCE. (Toronto, Canada, February 2002). Title: Improving potato tuber quality and seed performance by calcium nutrition.
31. INTERNATIONAL SOCIETY OF HORTICULTURAL SCIENCE AND AMERICAN SOCIETY OF HORTICULTURAL SCIENCE JOINT SYMOSIUM ON LOW TEMPERATURE STRESS IN PLANTS. (Toronto, Canada, August 2002). Keynote speaker: Mechanism of freezing in tender plants: Developing strategies for improvement.
32. MEXICAN NATIONAL POTATO CONFERENCE (Leon, Mexico, September 2002). Title: Improving potato tuber quality and seed piece performance by calcium nutrition.
33. ATLANTIC AGRICULTURAL SCIENCE AND TECHNOLOGY WORKSHOP (Truru, Nova Scotia, Canada, November 2004). Title 1: Potato tuber quality and calcium nutrition. Title 2: Natural lipids as novel bioregulators.
34. POTATO AND VEGETABLE CONFERENCE. (New Brunswick, Canada, March 2005). Title: Potato tuber quality and Calcium nutrition.
35. INTERNATIONAL POTATO CENTER (CIP, Lima – Peru, May 2005) Title: Improving tuber quality and frost tolerance by merging physiological, biochemical, and genetic approaches; role of membrane lipids and tuber calcium.
36. UNIVERSITY OF MINNESOTA (St. Paul, September 2005) Title: Novel lipids and calcium as plant growth regulators; linking basic research to practical applications.

37. INTERNATIONAL POTATO CENTER (CIP, Lima – Peru, November 2005) Title: Mechanisms for obtaining abiotic stress resistance; merging biochemical, physiological and genetic approaches in plant breeding.
38. POTATO AND VEGETABLE CONFERENCE. (Ontario, Canada, March 2006). Title: Potato tuber quality and calcium nutrition.
39. INTERNATIONAL POTATO CENTER (CIP, Lima – Peru, May 2006) Title: Breeding potato for environmental stress resistance: developing strategies by merging physiological, biochemical and genetic approaches.
40. CROP SCIENCE SOCIETY OF AMERICA (Indianapolis, November 2006). Title: Searching for genes controlling frost and winter survival: merging physiological, biochemical and genetic approaches to make real progress.
41. INTERNATIONAL SOCIETY OF HORTICULTURAL SCI. (Seoul, Korea, August 2006). Title: Lysophospholipids as plant bioregulators. Invited paper presented at the symposium: endogenous and exogenous bioregulators.
42. GLOBAL POTATO CONFERENCE: Opportunities and challenges in the new millenium (New Dehli, India. December 9-12, 2008). Title 1: Developing strategies for moving frost hardy genes to the cultivated potato. Title 2: Role of calcium in potato tuber internal quality and storage quality: A new concept in potato nutrition.
43. POTATO SCIENCE FOR THE POOR – CHALLENGES FOR THE NEW MILLENIUM (Cuzco, Peru. March 25-28, 2008). Title 1: Improving abiotic stress resistance of cultivated potatoes: moving frost hardy genes from wild potatoes and making real progress using precise screening tools. Title 2: Supplemental calcium nutrition may have the potential of improving tuber yield of native potatoes in the Peruvian highlands.
44. Lead Speaker at the 15th TRIENNIAL SYPOSIUM OF THE INTERNATIONAL SOCIETY FOR TROPICAL ROOT CROPS: Tropical Roots and Tubers in a Changing climate (Lima, Peru Nov 2-6, 2009). Title: understanding and managing the impact of abiotic stresses: Developing strategies for sustainable production in a changing climate.
45. FIRST INTERNATIONAL WORKSHOP ON RESEARCH AND EXTENSION OF POTATO INDUSTRY. (Inner Mongolia University, Huhhot, China. Nov 8-11, 2009.)
Three talks: Titles
 - a) Improving potato tuber quality and mitigate stress impact by calcium nutrition: Physiological and genetic approaches.
 - b) Searching for genes frost tolerance to develop frost hardy cultivars: Combining physiological and genetic approaches.
 - c) The University of Wisconsin Potato Breeding Program: Selection strategies and methodologies.

46. CHINESE ACADEMY OF AGRICULTURAL SCIENCES and UNIVERSITY OF... (China, April 2010). Invited to give two talks and discuss collaborative research opportunities. Title 1: Improving potato tuber quality and mitigate stress impact by calcium nutrition: Physiological and genetic approaches. Title 2: Searching for genes frost tolerance to develop frost hardy cultivars: Combining physiological and genetic approaches.
47. B.Y. MORRISON MEMORIAL LECTURE, Selected by USDA/ Agricultural Research Service, Co-Sponsored by the American Society of Horticultural Science in recognition of Outstanding contributions to Horticulture and Environmental Sciences to deliver this lecture at the annual meetings of the American Society of Horticultural Science, CA August 3, 2010. Title: Developing strategies for sustainable production in a changing global climate scenario: Merging physiological and genetic approaches.
48. KEYNOTE SPEAKER, INTERNATIONAL SYMPOSIUM ON AGRONOMY AND PHYSIOLOGY OF POTATO (Nevsehir, Turkey. September 20-24, 2010) Title: Improving potato tuber quality and production by targeted calcium nutrition: The discovery of tuber roots leading to a new concept in tuber nutrition.
49. INTERNATIONAL CONFERENCE ON PREPARING AGRICULTURE FOR CLIMATE CHANGE. (Ludhiana, India. February 6-8, 2011) Title: Sustaining agriculture production in view of climate change: Merging physiological and genetic approaches.
50. INTERNATIONAL POTATO PROCESSING AND STORAGE CONVENTION. (Denver, Colorado. June 21-23, 2011) Title: Improving Potato Tuber Quality and Storability by Targeted Calcium Nutrition: Discovery of Tuber Roots Leading to a New Concept in Potato Nutrition.
51. INVITED SEMINARS TO POTATO GROWERS. (Hokkaido, Japan. 2013) Title: Calcium nutrition of potatoes to improve potato quality and mitigate the impact of abiotic stresses on potatoes.
52. KEYNOTE ADDRESS AT THE 10TH INTERNATIONAL PLANT COLD HARDINESS SEMINAR. (Poznan, Poland. 2014) Title: Progress in building a successful strategy for breeding frost tolerant potatoes for the Andean Highlands: Preparing for climate change.
53. INVITED SEMINAR AT THE NATIONAL POTATO RESEARCH INSTITUTE (INIA). (Lima, Peru. 2015) Title: Developing strategies for sustainable potato production in the Peruvian Highlands in a changing global climate scenario: Merging physiological and genetics approaches.

54. INVITED SEMINAR AT OBIHIRO UNIVERSITY. (Hokkaido, Japan. May and July, 2015) Title: Calcium nutrition of potatoes to improve potato quality and mitigate the impact of abiotic stresses on potatoes.
55. INVITED SEMINAR AT OBIHIRO UNIVERSITY. (Hokkaido, Japan. May and August 2016) During my two visits to this institute I presented two talks to the students and faculty. Title 1: Calcium nutrition of potatoes to improve potato quality and mitigate the impact of abiotic stresses on potatoes. Title 2: Use of natural lipids to improve fruit ripening and shelf-life.
56. INVITED SEMINAR TO POTATO GROWERS. (Prince Edward Island, Canada. 2016) Title: Improving potato quality and mitigating temperature stresses on potato crop.
57. INVITED SEMINAR TO POTATO GROWERS. (Calgary, Canada. 2016) Title: Improving potato quality and mitigating temperature stresses on potato crop.
58. INVITED SEMINAR TO POTATO GROWERS AND OBIHIRO UNIVERSITY. (Hokkaido, Japan. 2017) Title: Improving potato quality and mitigating temperature stresses on potato crop by calcium nutrition
59. NAGASAKI AGRICULTURAL AND FORESTRY TECHNICAL DEVELOPMENT CENTER. 2017. Title: A successful strategy for breeding potatoes for frost tolerance
60. TOKYO UNIVERSITY OF AGRICULTURE. 2017. Title: Improving potato quality and mitigating temperature stresses on potato crop by calcium nutrition.
61. OREGON STATE UNIVERSITY. 2017. Title: Improving potato quality and mitigating temperature stresses on potato crop by calcium nutrition.
62. WASHINGTON/OREGON POTATO CONFERENCE. 2018. Title: Calcium nutrition and potato tuber quality and production
63. INTERNATIONAL POTATO EXP, CHARLOTTETOWN, PRICE EDWARD ISLAND, CANADA. 2018. Title: Improving potato tuber quality, seed piece quality and mitigating stress impact by calcium nutrition.
64. OBIHIRO UNIVERSITY OF AGRICULTURE AND VETERINARY MEDICINE, JAPAN. 2018. Title: Methods, approaches in scientific research; Observation is key to the solution of practical problems.
65. CUSCO UNIVERSITY, CUSCO, PERU. 2018. Seminar to student and faculty. Title: Improving potato quality and mitigating temperature stresses on potato crop by calcium nutrition.

66. 11TH INTERNATIONAL PLANT COLD HARDINESS CONFERENCE. 2018. Title: Developing and implementing a successful strategy to develop frost hardy potatoes by merging physiological and genetic approaches.
67. 2019 NEW YORK STATE POTATO SCHOOL. (Waterloo, NY. February 2019) Title: Improving potato tuber quality, seed piece quality and mitigating stress impact by calcium nutrition.
68. 13TH INTERNATIONAL POTASH INSTITUTE SYMPOSIUM. (Kunming, China. November 2019) Title: Improving potato tuber quality, seed piece quality and mitigating stress impact by calcium nutrition.

(III) REFEREED PUBLICATIONS AND SYMPOSIA PROCEEDINGS

MECHANISM OF FREEZING INJURY AND COLD ACCLIMATION

1. Palta, J.P., Levitt, J., and Stadelmann, E.J. 1977. Freezing injury in onion bulb cells. I. Evaluation of the conductivity method and analysis of ion and sugar efflux from injured cells. *Plant Physiol.* 60:393-397.
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MECHANISM OF TRANSPORT OF WATER AND NON ELECTROLYTES AND STUDY OF PLANT CELL

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(IV) NON-REFEREED PUBLICATIONS AND GROWER MEETING PROCEEDINGS

MECHANISM OF FREEZING INJURY AND COLD ACCLIMATION

1. Palta, J.P. and Workmaster, B.A. 1996. Tolerance of cranberry plant to low temperature and flooding stress: Developing strategies for sprinkler frost protection and management of crop during overwintering. Cranberry Agri. Res. 1995 Progress Reports (Distributed to Cranberry researchers in the U.S.)
2. Workmaster, B.A. and Palta, J.P. 1996. Developing strategies for frost protection and crop management during spring and fall. Wisc. State Cran. Growers Assoc. Summer Mtg. and Field Day pp. 16-18.
3. Palta, J.P. 1997. Tolerance of cranberry plant to low temperature and flooding stress: Developing strategies for sprinkler frost protection and management of crop during overwintering. Cranberry Agri. Res. 1996 Progress Reports (Distributed to Cranberry researchers in the U.S.)
4. Workmaster, B.A. and Palta, J.P. 1997. Understanding cranberry frost hardiness. Proceedings of the Wisc. Cran. School. 8:40-45.
5. Workmaster, B.A. A., Palta, J.P. and Roper, T.R. 1997. Terminology for cranberry bud development and growth. The National Cranberry Magazine Cranberries 61(1):11-14.
6. Workmaster, B.A. and Palta, J.P. 1998. Understanding Cranberry Frost and Winter Hardiness. Proceedings of the Wisc. Cran. School. 9:57-65.
7. Workmaster B.A. and Palta J.P. 2000. Fall to winter cranberry plant hardiness. Proceedings of Wisconsin Cranberry School. v. 11, p 1-9.

8. Workmaster B.A., J.P. Palta and Wisniewski M. 2000. Observing how cranberry plants freeze. Cranberries. Feb issue p 14-18.

CALCIUM NUTRITION AND QUALITY OF POTATOES AND OTHER CROPS

1. Palta, J.P. and Kratzke, M.G. 1988. Enhancing tuber calcium uptake. Spudman #4, p.8.
2. Palta, J.P. 1989. Spoonfeeding tubers during bulking: A new concept in potato nutrition. The Badger Common'tator. 41(5):27.
3. Palta, J.P., Simpson, H., Weiss, L., Weis, G. and Bowen, B. 1990. Spoonfeeding tubers at bulking: A new concept in potato nutrition. Proc. Wisc. Ann. Potato Meetings. pp. 11-14.
4. Palta, J.P., Tawfik, A.A. and Weiss, L.A. 1992. Calcium management trials with potatoes. Proc. Wis. Ann. Potato Mtg., Univ. Wisc.-Madison. pp. 31-37.
5. Palta, J.P., Tawfik, A.A. and Weiss, L.S. 1993. Spoon feeding tubers at bulking: a practical mean for enhancing potato tuber quality and yield. Proc. Wis. Ann. Potato Mtg., Univ. Wisc.-Madison. pp. 6:117-122.
6. Tawfik, Ahmed A. , Palta, Jiwan P. 1993. Calcium and Nitrogen nutrition alleviates heat stress effect on potato growth. Proceedings of WI Ann. Potato Meet. pp. 123-130.
7. Palta, J.P. 1994. Spoonfeeding potatoes during bulking: The Badger Common'tator. 46(10):14-15.
8. Kleinhenz, M.D., James, V.R., Stevenson, W.R. and Palta, J.P. 1995. Calcium application increases potato tuber medullary tissue calcium concentration and may reduce the incidence and severity of seed piece decay due to *Erwinia carotovora*. Proc. Wis. ann. Potato Mtg., Univ. Wisc.-Madison 8:27.
9. Kleinhenz, M.D., Gunter, C.C. and Palta, J.P. 1995. Enhancing tuber calcium concentration through calcium application may reduce the incidence of internal brown spot and hollow heart. . Proc. Wis. ann. Potato Mtg., Univ. Wisc.-Madison. pp.8:215-216.
10. Gunter, C.C., Kleinhenz, M.D. and Palta, J.P. 1996. Reducing seed piece decay with calcium. Proc. Wisc. Annual Potato Meetings 9:23-27.
11. Kleinhenz, M.D., Gunter, C.L. and Palta, J.P. 1996. Calcium and nitrogen nutrition effects on potato tuber calcium levels and internal quality. Proc. Wisc. Annual Potato Meetings 9:29-40.
12. Palta, J.P. 1997. The calcium update: Impact of calcium nutrition on tuber quality and yield. Proc. Wisc. Annual Potato Meetings 10:217-226.

13. Gunter, C.C. and Palta, J.P. 1997. Calcium applications during seed tuber production: Effects on seed piece quality and growth the following season. Proc. Wisc. Annual Potato Meetings 10:27-32.
14. Palta, J.P.. 1997. The calcium update: Impact of calcium nutrition on tuber quality and yield. The Badger Common'tator. Aug. Issue, 1997. pp 25-42.
15. Gunter, C.C. and Palta, J.P. 1998. Supplemental calcium applications during seed tuber production: Effects on seed piece performance during subsequent growing season. Proc. Wisc. Annual Potato Meetings 11:41-50.
16. Gunter, Christopher C. and Palta, Jiwan P. 1998. Calcium's Effect on Potato Quality and Storability: Can raising seed tuber tissue calcium improve its performance? The Badger Common'tater. pp.15-20.
17. Palta, J., Ozgen, S., Gunter, C. and Karlsson, B. 1998. Response of potatoes (cv. Russet Burbank) to supplemental calcium applications: Tuber yield and internal quality. Proc. Wisc. Annual Potato Meetings 11:51.
18. Palta, J. 1999. The calcium kick: Improving potato quality begins with supplemental application. July. Potato Grower Magazine
19. Ozgen, S., Palta, J., Karlsson, B., and Gunter, C. 1999. Response of Potato (cv. Russet Burbank) to supplemental calcium applications: Tuber yield, internal quality and tuber calcium concentration. Proc. Wisc. Annual Potato Meetings 12:139-146.
20. Gunter, C.C. and Palta, J.P. 1999. Raising Seed Tuber Calcium May Impact Its Quality and Performance. Proc. Wisc. Annual Potato Meetings 12:105-116.
21. Karlsson, B., Palta, J., Ozgen, S., and Gunter, C. 1999. Response of Atlantic to Supplemental Calcium Applications During 1997 and 1998 Seasons: Tuber yield, internal quality and tuber calcium concentration. Wis. Annual Potato Meetings 12:117-126.
22. Karlsson, B., Palta, J., Ozgen, S., and Gunter, C.. 1999. Response of Potato Cultivars (Burbank, Norland, Snowden and Superior) to Supplemental Calcium Applications During 1997 and 1998 Seasons: Tuber yield, internal quality and tuber calcium concentration. Wis. Annual Potato Meetings 12:127-138.
23. Christopher C. Gunter, and Jiwan P. Palta, 2000. Calcium application at preemergence and during bulking may improve tuber quality and grade. Proceedings of Wisconsin Annual Potato Meetings 2000 v.13 p.415-431.
24. Bjorn H. Karlsson, Jiwan P. Palta, Senay Ozgen and Gunter, Christopher C. 2000. Response of Atlantic supplement calcium applications during 1998 and 1999 seasons:

Tuber yield, internal quality, bruising and tuber calcium concentrations. Proceedings of Wisconsin Potato Meetings 2000 v.13 p.311-332.

25. Bjorn H. Karlsson, Jiwan P. Palta, Senay Ozgen and Gunter, Christopher C. 2000. Response of Norland, Snowden and Superior potato cultivars to supplement calcium applications during 1998 and 1999 seasons: Tuber yield, internal quality, bruising and tuber calcium concentrations. Proceedings of Wisconsin Potato Meetings 2000 v.13 p.333-352.
26. Ozgen, S. , J.P. Palta, B.H. Karlsson, and Gunter, C.C. 2000. Response of Potato (cv. Russet Burbank) to supplement calcium applications during 1998 and 1999 seasons: Tuber yield, internal quality, bruising and tuber calcium concentrations. Proceedings of Wisconsin Potato Meetings 2000 v.13 p.431-440.
27. Karlsson, B., Palta, J.P., Ozgen, S. and Gunter, C. 2001. Response of Potato cultivars (Atlantic, Norland, Snowden and Superior) to supplemental calcium nitrate applications during 1999 and 2000 seasons: Bruising, tuber yield, internal quality and tuber calcium concentration. Proceedings of Annual Wisconsin Potato Meetings 14:103-114
28. Karlsson, B., Palta, J.P., Gunter, C. and Ozgen, S. 2001. Response of Russet Burbank to supplemental calcium applications during 1999 and 2000 seasons: Bruising, yield, internal quality and tuber calcium concentrations. Proceedings of Annual Wisconsin Potato Meetings 14:115-124
29. Ozgen, S., Palta, J.P., Gunter, C.C. and Karlsson, B.H. 2001. Impact of source and timing of calcium and nitrogen applications on 'Burbank' potato tuber calcium concentrations, tuber yield and internal quality. Proceedings of Annual Wisconsin Potato Meetings 14:125-134.
30. Karlsson, B.H., Palta J.P., Ozgen S. and Gunter C.C. 2002. The effect of supplemental calcium application on: I. Impact pendulum bruising, tuber yield and specific gravity. II. Seed piece performance Proc. Wisc. Ann. Potato Mtg. 15:135-146.
31. Karlsson, B.H., and Palta, JP. 2003. The effect of supplemental calcium applications on tuber physiology: Bruise incidence, oxidative potential, internal defects, specific gravity and yield. Proceedings of Annual Wisconsin Potato Meetings 16:51-65.
32. Palta, J.P. 2004. Application timing of calcium and nitrogen blends: Influence on tuber quality and Yield. Proceedings of Annual Wisconsin Potato Meetings 17:85-86.
33. Bamberg, J.B. and Palta, J.P. 2004. Transferring extreme tuber calcium uptake from wild species to *tuberosum* cultivars. Proceedings of Annual Wisconsin Potato Meetings 17:141.

34. Karlsson, B.H. and Palta, J.P. 2004. Multi-season report on effectiveness of supplemental calcium application to reduce mechanical harvest induced bruising and 2003 update. Proceedings of Annual Wisconsin Potato Meetings 17:323-344.
35. Karlsson, B.H., Silva, E.M., Simon, P.W. and Palta, J.P. 2004. Effect in season supplemental calcium application on sugar end and chip quality. Proceedings of Annual Wisconsin Potato Meetings 17:345-350.
36. Palta, J.P. and Busse, J.S. 2005. Testing the influence of application time and rate of calcium and nitrogen blends on tuber yield and quality. Proceedings of Annual Wisconsin Potato Meetings 18:153-156.
37. Karlsson, B.H. and Palta, J.P. 2005. Effect of in-season supplemental calcium application on chip and fry quality: glucose and sucrose concentration and 2004 field update. Proceedings of Annual Wisconsin Potato Meetings 18:157-166.
38. Palta, J.P. and J.S. Busse 2006. Testing the influence of application time and rate of calcium and nitrogen blends on tuber yield and quality. Proceedings of the Wisconsin's Annual Potato Meeting. 19:125-132.
39. Vega, S.E., J.P. Palta, and J. Bamberg. 2006. Exploiting cultivated germplasm to breed for enhanced tuber quality. Proceedings of the Wisconsin's Annual Potato Meeting. 19:143-144.
40. Busse, J.S. and Palta, J.P. 2007. Investigating *in vivo* calcium transport path to developing potato tuber using ⁴⁵Ca: a new concept in potato tuber calcium nutrition. Proceedings of Annual Wisconsin Potato Meetings 20:29-31.
41. Palta, J.P., Busse, J.S., Karlsson, B.H. and Ozgen, S. 2007. Research update on potato tuber quality and calcium nutrition: 2006 published research highlights. Proceedings of Annual Wisconsin Potato Meetings 20:27-28.
42. Palta, J.P., Bamberg, J.B., Vega, S.E. Navarro, F.M., and Bowen, B. 2008. Genetic improvement of potato for tuber calcium uptake. Proceedings of Annual Wisconsin Potato Meetings 21:15-20.
43. Palta, J.P., Navarro, F.M., Bamberg, J.B., Vega, S.E. and Bowen, B. 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.

DISCOVERY OF NATURAL LIPID AS NOVEL REGULATORS: FRUIT RIPENING AND SENESCENCE

1. Farag, K.M. and Palta, J.P. 1991. Potential use of natural lipids for improvement of cranberry fruit color and improvement of its keeping quality. North American Cranberry Research and Extension Workers Conference, Boston, MA.
2. Farag, K.M. and Palta, J.P. 1991. Use of lysophosphatidylethanolamine, a natural lipid, as an aid for fruit ripening and improving keeping quality. Proc. 17th Ann. Meetings. Plant Growth Reg. Soc. of Amer. pp. 135-137.
3. Farag, K.M. and Palta, J.P. 1991. Surface morphology and ultrastructure of various parts of cranberry plant: implications in environmental adaptations and in uptake of foliar applied chemicals. North American Cranberry Research and Extension Workers Conference, Boston, MA.
4. Palta, J.P., Farag, K.M. and Weiss, L.S. 1991. Color enhancement in cranberry fruit by using environmentally safe natural products. Wisc. Cranberry School Proc. pp. 36-44.
5. Farag, K.M. and Palta, J.P. 1992. Lysophosphatidylethanolamine, a natural lipid enhances ripening and improves keeping quality of tomato fruit without damage to leaves. Proc. 18th ann. Mtg. Plant Growth reg. Soc. Amer. pp. 9-10.
6. Palta, J.P. and Workmaster, B.A. 1996. Tolerance of cranberry plant to low temperature and flooding stress: Developing strategies for sprinkler frost protection and management of crop during overwintering. Cranberry Agri. Res. 1995 Progress Reports (Distributed to Cranberry researchers in the U.S.)
7. Workmaster, B.A. and Palta, J.P. 1996. Developing strategies for frost protection and crop management during spring and fall. Wisc. State Cran. Growers Assoc. Summer Mtg and Field Day pp. 16-18.
8. Workmaster, B.A. and Palta, J.P. 1997. Understanding cranberry frost hardiness. Proceedings of the Wisc. Cran. School. 8: 40-45.
9. Palta, J.P. 1997. Using natural lipids to accelerate ripening (uniform color development and promote shelf life of cranberries) Cranberry Agri. Res. 1996 Progress Reports (Distributed to Cranberry researchers in the U.S.)
10. Workmaster, B.A. A., Palta, J.P. and Roper, T.R. 1997. Terminology for cranberry bud development and growth. The National Cranberry Magazine Cranberries 61(1):11-14.
11. Palta, J.P. 1997. Tolerance of cranberry plant to low temperature and flooding stress: Developing strategies for sprinkler frost protection and management of crop during overwintering. Cranberry Agri. Res. 1996 Progress Reports (Distributed to Cranberry researchers in the U.S.)
12. Workmaster, B.A. and Palta, J.P.. 1998. Understanding Cranberry Frost and Winter Hardiness. Proceedings of the Wisc. Cran. School. 9:57-65.

13. Ozgen, M. and Palta, J.P. 1998. Using natural lipids to accelerate ripening and uniform color development and promote shelf life of cranberries. Proc Wisc Cran School 9: 66-72.
14. Ozgen, M. Workmaster, B. A. and Palta, J. P. 1998. Relationship between fruit color (ripening) and shelf life of cranberries: Physiological and anatomical explanation. Proc Wisc Cran School 9:73- 81.
15. Ozgen, M. and Palta, J.P. 1999. Using natural lipids to accelerate ripening (uniform color development) and promote shelf life of cranberries. Wisc State Cran Growers Assoc. Summer Meeting and Field Day Booklet. Pp 33-34.

POTATO BREEDING AND GENETICS

1. Bamberg, J.B. and Palta, J.P. 2004. Transferring extreme tuber calcium uptake from wild species to *tuberosum* cultivars. Proceedings of Annual Wisconsin Potato Meetings 17:141.
2. Groza, H., Bowen, B., Palta, J.P. and Jiang, J. 2005. Results of the Wisconsin Potato Breeding Program – 2004. Proceedings of Annual Wisconsin Potato Meetings 18:167-174.
3. Palta, J.P., Navarro, F.M. and Bowen, B. 2005. New faces and exciting opportunities at UW potato breeding program. The Badger Common'Tater November issue.
4. Bowen, B.D., H. Groza, J. Jiang, F. Navarro and J.P. Palta. 2006. SPudPro-New lines and field experiences. Proceedings of the Wisconsin's Annual Potato Meeting. 19:21-30.
5. Bowen, B., Kostichka, C., Navarro, F. and Palta, J.P. 2007. SPUDPRO – A Wisconsin idea. Proceedings of Annual Wisconsin Potato Meetings 20:9-14.
6. Navarro, F., B. Bowen, J. Jiang, H.I. Groza, and J. P. Palta. 2006. Development of varieties with enhanced resistance to common scab. Proceedings of the Wisconsin's Annual Potato Meeting. 19:135-142.
7. Vega, S.E., J.P. Palta, and J. Bamberg. 2006. Exploiting cultivated germplasm to breed for enhanced tuber quality. Proceedings of the Wisconsin's Annual Potato Meeting. 19:143-144.
8. Navarro, F., Bowen, B., and Palta, J.P. 2007. Potato Breeding Program Research Update 2007. Proceedings of Annual Wisconsin Potato Meetings 20:151-176.
9. Palta, J.P., Bamberg, J.B., Vega, S.E. Navarro, F.M., and Bowen, B. 2008. Genetic improvement of potato for tuber calcium uptake. Proceedings of Annual Wisconsin Potato Meetings 21:15-20.
10. Palta, J.P., Navarro, F.M., Bowen, B. and Vega, S.E. 2008. UW Potato Breeding Program progress and update. Proceedings of Annual Wisconsin Potato Meetings 21:109-124.

11. Palta, J.P., Navarro, F.M., Bamberg, J.B., Vega, S.E. and Bowen, B. 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.
12. Palta, J.P., Navarro, F.M., Bowen, B. and Vega, S.E. 2009. UW Potato Breeding Program progress and update. *Proceedings of Annual Wisconsin Potato Meetings* 22:47-60.
13. Navarro, F.M., Bowen, B., Vega, S.E. and Palta, J.P. 2009. Potato Breeding Program Research Update. *Proceedings of Annual Wisconsin Potato Meetings* 22:61-80.
14. Palta, J.P., Navarro, F.M., Bowen, B. 2009. Wisconsin Potato Breeding Program Report. NCCC84 Meetings, Chicago, IL, December, 19 p.
15. Zorrilla, C., Navarro, F., Vega, S., Bowen, B., Bamberg, J. and Palta, J. 2009. Breeding for Tuber Internal Quality: Searching for a new improved Atlantic. NCCC84 Meetings, Chicago, IL, December, 2 p.
16. Navarro, F.M., Bowen, B., and Palta, J.P. 2010. Potato Breeding Program Research Update Field Year 2009. *Proceedings of Annual Wisconsin Potato Meetings* 23:21-38.
17. Zorrilla, C., Navarro, F., Vega, S., Bowen, B., Bamberg, J. and Palta, J. 2010. Breeding for Tuber Internal Quality: Searching for a new improved Atlantic. *Proceedings of Annual Wisconsin Potato Meetings* 23:11-19.
18. Navarro, F., B. Bowen and J. Palta. 2011. Progress in breeding for processing chips, russets and fresh market potatoes. *Proceedings of the Wisconsin's Annual Potato Meeting* 24:53-73.
19. Navarro, F., B. Bowen and J. Palta. 2011. New Wisconsin potato varieties and elite breeding lines in 2011. *Proceedings of the Wisconsin's Annual Potato Meeting* 24:75-89.
20. Navarro, F.M., Bowen, B.D., Vega, S., Rak, K., Zorrilla, C., Bamberg, J. and J. Palta. 2012. Trait selection in Potatoes: Finding the needle in the Haystack. *Proceedings of Annual Wisconsin Potato Meetings* 25:11-31.
21. Navarro, F.M., Banks, E., Higgins, C., Bowen, B.D. and J. Palta. 2012. Varietal resistance to common scab. *Proceedings of Annual Wisconsin Potato Meetings* 25:103-113.
22. Rak, K. and J. Palta. 2012. Molecular markers for cold chipping quality based on a candidate gene approach. *Proceedings of Annual Wisconsin Potato Meetings* 25:32-35.
23. Bowen, B., LeMere, M., Navarro, F. and J. Palta. 2012. 2011 SPUDPRO Candidate Trial. *Proceedings of Annual Wisconsin Potato Meetings* 25:49-53.

24. Navarro, F., B. Bowen and J. Palta. 2013. Potato Breeding Program Research Update Field Year 2012. Proceedings of the Wisconsin's Annual Potato Meeting 26: 79-114.
25. Bowen, B., LeMere, M., Navarro, F. and J. Palta. 2013. SPUDPRO Candidate trial. Proceedings of the Wisconsin's Annual Potato Meeting 26: 115-120.
26. Jiwan, P., Bowen, B., Navarro, F., Endelman, J. Rak, K., Zorilla, C., Schabow, J. and S. Vega. 2014. Potato Breeding Program Research Update Field Year 2013. Proceedings of the Wisconsin's Annual Potato Meeting 27: 117-129.

Teaching

I teach Environment of Horticultural Plants (HORT 320) every year. This is one of three required courses by the students majoring in Horticulture. My teaching evaluations are very favorable and among the top two or three courses taught in our department. I have offered many seminar courses to the graduate students in the Department of Horticulture well as jointly with the Department of Agronomy and in the Department of Plant Breeding and Plant Genetics. In addition I have given guest lectures in several courses including the Chemistry of Food Lipids, Physiological Plant Ecology and Principles of Plant Breeding.

In the past 5 years on average 6 undergraduate students work as student hourlies helping in our laboratory and field research. A number of them have registered for research projects under my direction.

Currently I have three graduate students, two assistant scientists and three visiting scholars from abroad (China, Egypt and Turkey) working in my laboratory.

Present and Past Graduate Students and Postdoctorals

M.S. Degrees

1. Joyce K. Pohlman -- M.S. 1980-81. Conducted research on the alterations of mitochondrial function in onion cells following freezing injury. Palta was co-advisor.
2. Marian G. Kratzke -- M.S. 1985. Research on "Mechanism of calcium uptake by potato tuber."
3. Hedy Simpson -- M.S. 1990. Research on investigating practical means to enhance calcium uptake of potato tubers.
4. Laurie S. Weiss -- M.S. 1992. Research on freeze-thaw rates in nature and their impact on photosynthesis, respiration and cell membrane functions.
5. Julie Stone -- M.S. 1992. Inheritance of freezing tolerance and cold acclimation and examination of the mechanical mech. associated with cold acclimate in Solanum species. (Co-Advisor with John Bamberg)

6. Sandra Vega-Semorile -- M.S. 1994 – Cold-acclimation in potato species. (Co-Advisor with John Bamberg)
7. Bjorn Karlsson -- M.S. Spring 1995. Research on the role of boiling stable polypeptides in freeze-thaw injury and cold acclimation.
8. Chris Gunter -- M.S. 1997—Potato seed piece quality and calcium nutrition.
9. Elizabeth Workmaster -- M.S. 1997 – Cranberry bud frost hardiness.
10. Mustafa Ozgen -- M.S. 1997 – Cranberry fruit ripening and natural lipids.
11. Sookhee Park -- M.S. 2000 -- Calcium nutrition and heat stress in potatoes.
12. Senay Ozgen -- M.S. 2000 – Calcium nutrition and potato tuber quality.
13. Anne Reis – M.S. 2002 -- Calcium nutrition and tuber skin health in red potatoes.

Ph.D. Degrees

1. Kenneth L. Steffen -- Ph.D. 1986. Thesis on "Role of photosynthetic process in cold acclimation of potato species."
2. Marian G. Kratzke -- Ph.D. 1987. Thesis research on calcium uptake by potato tuber.
3. Karim M. Farag -- Ph.D. 1989. Thesis research on "Transport properties of cranberry fruit cuticle: chemical means of promoting anthocyanin production."
4. Ashraf Abdallah -- Ph.D. 1989. Thesis research on "Changes in the physical properties of membrane lipids during fruit ripening."
5. Rajeev Arora -- Ph.D. 1990. Thesis research of Perturbation of membrane calcium during the early stages of freezing injury.
6. Marja-Liisa Sutinen -- Ph.D. 1990. Plasma membrane lipid and plasma membrane ATPase in relation to cold acclimation in pine needles.
7. Ahmed Tawfik -- Ph.D. 1993. Impact of calcium and nitrogen nutrition on plant growth, productivity and tuber quality in *Solanum* species: Implications in response to heat stress
8. Matthew Kleinhenz -- Ph.D. 1996. Calcium effects on tuber quality and plant response to heat stress.

9. Yu-Kuang Chen -- Ph.D. 1998. Expression of freezing tolerance in interspecific F₁ and Somatic hybrids of potatoes. (Co-Advisor with John Bamberg)
10. Sandra Vega-Semorile -- Ph.D. 2000. Understanding mechanisms of potato cold hardiness by merging physiological, genetic and molecular approaches.
11. Chris Gunter -- Ph.D. 2001. Calcium effects on potato tuber quality and seed piece vigor.
12. Beth Ann A. Workmaster -- Ph.D. 2001. Cold Hardiness, ice nucleation, and growth modeling in cranberry plants.
13. Mustafa Ozgen -- Ph.D. 2002. Modulation of fruit ripening and plant senescence by a natural lipid lysophosphatidylethanolamine (LPE).
14. Senay Ozgen -- Ph.D. 2003. Influence of root zone calcium on potato tuberization, shoot growth and tuber quality.
15. Cinthya Zorilla – PhD 2013. Studying genetic relationships between tuber quality and tuber calcium and investigating the role of a calcium transporter gene CAX1 in tuber calcium uptake.
16. Zienab Ahmed PhD 2014 Physiological investigations aimed at understanding the effect of a natural lipid, lysophosphatidylethanolamine, on shelf life and ripening of fruit and on root growth
17. Kyle Rak PhD 2015. Developing and validating molecular markers associated with resistance to cold sweetening in potato.
18. Young Suk Chung (advisor Shelley Jansky; co-advisors Jiwan Palta, Michael Havey and John Bamberg) 2015. Mapping genes for tuber calcium uptake in a wild diploid potato population and studying relationship between tuber calcium and soft rot.

Post-Doctoral Research Associates and Scientists

1. OK Young Lee-Stadelmann -- Postdoctoral, 1979-80. Conducted research on basic aspects of plant-water relations.
2. Elise Rose -- Postdoctoral Research Associate, 1985-86. Research on effect of nuclear winter on plant productivity and survival.
3. S. Iswari -- Postdoctoral Research Associate, 1987-90. Research on Plasma membrane response to cold stress in genetically related potato species.
4. Karim M. Farag -- Postdoctoral Research Associate, 1983-93. Research on use of natural compounds as aid in fruit ripening.

5. James F. Harbage -- Postdoctoral Research Associate, 1992-94. Research on cosegregation of plasma membrane lipids with freezing tolerance and cold acclimation.
6. Rita Teutonico -- Postdoctoral Research Associate, 1992-94. Research on mapping cold responsive genes in Brassica.
7. Minati Singh -- Postdoctoral Research Associate, 1995-1997. Molecular aspects of coldacclimation response in potatoes.
8. Navjot K. Mangat -- Postdoctoral Research Associate, 1994-1997. Research on membrane lipids in relation to freezing tolerance, cold acclimation and fruit ripening.
9. Stephan B. Ryu -- Postdoctoral Research Associate, 1995-2000. Mechanism of modulation of fruit ripening and senescence in plants by natural lipids.
10. Jim Busse --. Assistant Scientist, 2002-2006. (Joint Program with John Bamberg)
11. Sandra Vega --. Postdoctoral Research Associate, 2002-2007. (Joint Program with John Bamberg)
12. Sandra Vega – Assistant Scientist, 2007- 2014
13. Felix Navarro – Assistant Scientist, 2005 - 2014

Visiting Scholars

Dr. Vladimir Vechernov 2007 and 2009-2010, from the N.I. Vavilov Research Institute of Plant Industry in Russia. 1. Screening potato and barley germplasm for frost hardiness. 2. Developing potato transgenics with over-expressed calcium transporter gene.

Dr. Ayman Badran 2008-2009, from the Desert Research Institute, Cairo, Egypt. Genetic variation for salinity tolerance in cultivated potatoes and mitigation of salinity stress induced damage by calcium

Dr. Nese Okut 2009-Present, from the University of Yuzuncu Yil, Van, Turkey. Genetic variation for salinity tolerance in cultivated potatoes and mitigation of salinity stress induced damage by calcium. Developing in-vitro tissue culture method for screening potatoes for salinity tolerance

Mr. Amr Hassan 2010 – Present from Desert Research Institute Cairo, Egypt Genetic variations for salinity tolerance and role of mycorrhiza in salinity stress tolerance

Mr. Lei Fi 2010- Present from Chinese Academy of Agricultural Sciences. Developing molecular markers for breeding potatoes for frost tolerance

Recent Undergraduate Students Special Research Projects

2005

Michael Heinrich: Identification of molecular markers in potato populations segregating for tuber calcium and quality.

Carrin Carlson: Interaction of calcium and auxin in potato shoot apical growth in vitro.

2006

Michael Heinrich: Identification of molecular markers in potato populations segregating for tuber calcium and quality.

Cole Haskell: Interaction of calcium and auxin in potato shoot apical growth in vitro.

2007

Emily Kowalski: Calcium movement in sandy soils and in potato plant.

2008

Emily Kowalski: Calcium movement in sandy soils and in potato plant.

2009

Nicholas Howard: Calcium movement in sandy soils and in potato plant.

Andrea Wolck: Response of potato Cultivars to salinity stress modulated by Ca.

Michael Chesna: Response of potato cultivars to Na and osmotic stress in tissue culture system.

2010

Ahmed Sadek: Relationship between tuber calcium and tuber cellular health.