



e-ifc No. 9, August 2006

Electronic International Fertilizer Correspondent (*e-ifc*). Quarterly correspondent from IPI.

Editorial

IPI has a long history of communication with its readers around the world. With changing times – we change tools. For a few decades we published ‘Potash Review’, which some of you probably remember. With the rapid increase in the citing of electronic literature, we decided to modify this scientific publication into the ‘International Fertilizer Correspondent’ (*ifc*), issued two to three times a year. This was sent to thousands of you in all parts of the world. But today, with the web and email systems, we are changing tools again and launch our new ‘*e-ifc*’, an electronic newsletter that will reach you by email and contain links to additional content posted on our website.

e-ifc No. 9 is the first edition of *ifc* in this new electronic format.

This is how communication is done these days. From Amlaha, a village in Madhya Pradesh in Central India, to El Serw, a research station in the Delta Nile in Egypt, to Pergamino, a town in the Argentinean Pampa and back to the large oil palm estates in Malaysia – web connection is now common and available to many of the agriculture community. The challenge now is to add content: the right information, in the right format, at the right time, to the right audience.

The *e-ifc* will contain similar sections as in the former *ifc* editions. We will collate research results from our research projects in various regions, inform you of our next

workshops and various symposia, update you on our recent publications and discuss with you recent developments related to nutrient management and fertilization practices with emphasis on potassium.

This first version of *e-ifc* is dedicated to sharing with you some research findings and providing a general description of the various IPI activities.

I hope that you will find the content, as well as the media interesting and beneficial.

I wish you all an enjoyable read.

Hillel Magen

Director



Countries in which IPI is active.

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Potassium (K) (often referred to as potash, K_2O) is an essential nutrient for all living organisms. It has a vital role in plant metabolism, growth and adaptation to stress. Adequate amounts of K must be available in the soil for its uptake by roots to ensure that crops achieve economic yields of acceptable quality.



Fruit market in Brazil. Photo by Dr. Alexey Naumov, IPI Coordinator, Latin America.

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Research findings

This section briefly describes some of our latest findings taken from IPI projects in various regions of the world. IPI has more than 100 projects under way. These are conducted with the cooperation of scientists, extension workers and farmers in many countries, and reflect our philosophy to share, explore and test relevant hypotheses.

The wealth of information that can be obtained from our research experiments will soon be made available as a new database on our website (www.ipipotash.org).

Fertigation is the application of fully soluble or liquid fertilizers through irrigation systems. Drip, jets, sprinklers and even pivot-center systems are an excellent carrier for nutrients. In fact, with a correctly designed and installed irrigation system, nutrients are applied with very high uniformity. This in itself is of great importance in terms of fertilizer use efficiency.

IPI has fertigation projects in India, China and Egypt. In the field of fertigation training, IPI Coordination India, with the Fertilizer Association of India (FAI) conducts an annual training course in various parts of the country. The next course is scheduled on the 6 October 2006, in Coimbatore. For more details contact IPI Coordinator India, Dr. Patricia Imas, at patricia.imas@ipipotash.org.

The 2nd IPI-JUST-NCARTT training course on fertigation, a 5 days full training program (26-30 November 2006) will be conducted by IPI Coordination WANA, in Irbid, Jordan. For more details please contact Prof. Munir Rusan, at mrusan@just.edu.jo.

Two large-scale K fertigation experiments are being conducted by IPI:

In China, with cooperation of the Shandong Soil and Fertilizer Station in Jiaonan and the National Agro Technical and Extension Service (NATESC), (principal investigator Dr. Yan Peng), we enter the third year of testing fertigation regimes in apples (Red



Control head of the apple fertigation experiment.

Delicious, introduced from Japan). Preliminary results from the trials, located in Penglai country, Shandong, show yield and quality (apple weight) increases with application of fertigation (see Fig. 1 & 2). For more details on this project please contact IPI Coordinator China, Dr. Svetlana Ivanova, at Svetlana.Ivanova@uralkali.com.

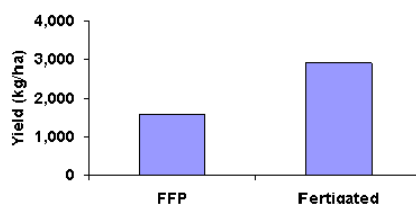


Fig. 1. Effect of fertigation on apple yield.

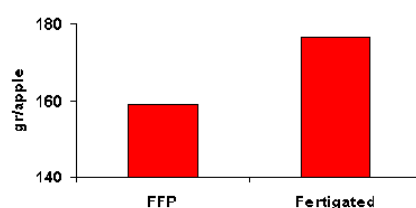


Fig. 2. Effect of fertigation on apple weight.

FFP = Farmers' fertilizer practice.

The importance of sugarcane is increasing, both for generating additional supplies of sugar and in biofuels production. India is the second largest producer of sugarcane in the world (after Brazil), but production is heavily based on irrigation, and efficient water management is therefore crucial. IPI, in cooperation with the Vasantdada Sugar Institute (VSI) in

Pune, Maharashtra, (principal investigator Dr. A.S. Deshmukh), are investigating the effect of different levels of K, applied through drip irrigation, on yield and quality of sugarcane as well as the water and fertilizer use efficiency.

Results show that a yield increase of 50% (millable cane yield) can be achieved with only 60% of the water (with fertigation) as compared to conventional irrigation (furrow). For more details please contact IPI Coordinator India, Dr. Patricia Imas, at patricia.imas@ipipotash.org.



IPI Director, Mr. Hillel Magen and IPI Coordinator India, Dr. Patricia Imas, discussing the fertigation management of the plot with colleagues from the VSI (India, 2005).

Potassium plays a crucial role in yield formation and quality of horticultural crops. In an experiment in the Aitos – Bourgas region, Bulgaria, Dr. Thomas Popp and colleagues from the National Agricultural Advisory Service (NAAS), demonstrated the effect of potash fertilizers on yield of sweet cherry. They found that the application of 120 kg K₂O/ha of potash (KCl) increased yield by 41% as compared to zero K application (control). The use of kalimagnesia (same K level plus additional Mg) further improved yield (Fig. 3).

For more details please contact IPI Coordinator Central Europe, Dr. Thomas Popp, at Thomas.Popp@kali-gmbh.com.

In another experiment in Bulgaria, (Kaloianovo - Plovdiv region), NPK treatment was compared with NP, NK and PK (omission plots technique). The demonstration trial showed farmers the importance of balanced nutrition.

Research findings

As the sunflower variety is not optimal for oil production - being grown for feeding purposes - oil content achieved is rather low (Fig. 4). However, the results show that the yield and oil content (and thus the 'oil yield'; not presented) are best with balanced fertilization of N, P & K. The order of reduced yield due to omission of a specific nutrient was $P > K > N$.

For more details please contact IPI Co-ordinator Central Europe, Dr. Thomas Popp, at Thomas.Popp@kali-gmbh.com.

More about SSNM

The "Reaching Toward Optimal Productivity" (RTOP) workgroup of the Irrigated Rice Research Consortium (IRRC) has been instrumental in the development, evaluation, and promotion of site-specific nutrient management (SSNM) as an approach for increasing the profit of Asian rice farmers through more efficient use of plant nutrients. It operates through partnership with the national agricultural research and extension systems (NARES) in Bangladesh, China, India, Indonesia, Myanmar, Philippines, Thailand, and Vietnam. In 2005, RTOP activities were incorporated into the new "Productivity and Sustainability" workgroup of Phase III (2005-2008) of the IRRC. Activities in 2005 centered on: 1) promoting SSNM as a standard, plant-based approach applicable to lowland rice across Asia; 2) developing locally

adapted recommendations based on the principles of the SSNM approach; 3) developing promotional materials on SSNM and the leaf color chart (LCC); and 4) building partnerships with national and local research and extension organizations and the fertilizer sector for wide-scale dissemination and uptake of SSNM. SSNM was further refined into an approach based on simple principles applicable to rice across irrigated and favorable rain-fed lowland production areas in Asia. We used these principles to develop locally adapted nutrient management recommendations tailored to location-specific needs and conditions in major rice-growing areas of Asia. Partnerships for the wide-scale promotion and dissemination were strengthened, particularly through workshops and training programs with representatives from national and local research and extension organizations and the fertilizer sector in the partner countries. The promotion of the new standardized 4-panel LCC continued with more than 100,000 units distributed in 2005 throughout Asia, with recommendations tailored to local rice production. Several papers on SSNM were prepared for local and international journals.

(This excerpt is from the annual technical report submitted to IPI).

See more, learn more, and download more site-specific fertilizer recommendations at <http://www.irri.org/irrc/ssnm/>.

This project is supported by the Swiss Agency for Development and Cooperation (SDC), the International Fertilizer Industry Association (IFA), the International Potash Institute (IPI), and the Potash and Phosphate Institute/Potash and Phosphate Institute Canada (PPI/PPIC).



A slide from a presentation available on the SSNM web site.

Visit the SSNM web site at: <http://www.irri.org/irrc/ssnm/>.

The *e-ifc* No. 10 will contain much more data on SSNM and its adoption in South-East Asia.

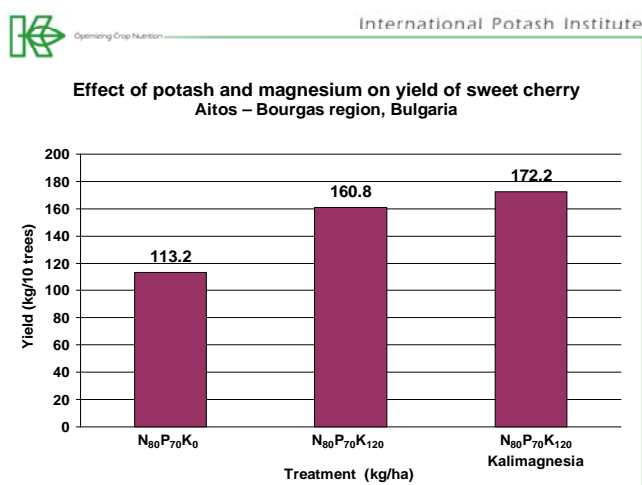


Fig. 3. Effect of potash and magnesium on yield of sweet cherry (Bulgaria, 2005).

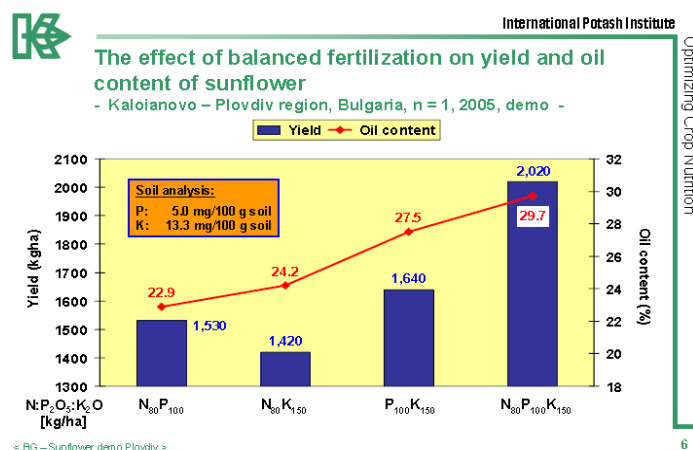


Fig. 4. The effect of balanced fertilization on yield and oil content of sunflower.

IPI Coming events

19-21 September 2006, Bonito, Brazil:

Simpósio sobre Potássio em Sistemas Agrícolas do Cerrado da América do Sul Práticas adequadas de adubação em solos de baixa fertilidade (Potash in Agricultural Systems of the Tropical Savannas of South America: Adequate Practices of Fertilization for Low Fertile Soils). IPI satellite event at *FERTBIO – Brazilian Congress of Soil Fertility and Plant Nutrition*. Conventions Center, Bonito, Mato Grosso do Sul, Brazil. For more details contact IPI Coordinator Latin America, Dr. Alexey Naumov, at alnaumov@geogr.msu.ru. Please also see at www.ipipotash.org

6-7 October 2006, Coimbatore, India:

IPI-FAI Training Program on Fertigation. Target audience: Fertilizer dealers, progressive farmers practicing drip irrigation, State Department of Agriculture, the fertiliser industry, dept of agriculture and institutional agencies. The program contains lectures + half day field visit. For more details contact IPI Coordinator India, Dr. Patricia Imas, at patricia.imas@ipipotash.org. Please also see at www.ipipotash.org

13 October 2006, Piracicaba, SP, Brazil:

WORKSHOP SOBRE NUTRIÇÃO E ADUBAÇÃO DA BANANA. For more details see www.ipipotash.org or contact IPI-PPI-PPIC joint mission director at Potafos, Dr. Tsuioshi Yamada at yamada@potafos.org.

13-15 November 2006, Zhuhai City, Guangdong, China:

The 11th IPI-ISSAS International Workshop on Soil Potassium and K fertilizer Management. The International Potash Institute (IPI, Switzerland) and the Institute of Soil Science, Chinese Academy of Sciences will hold jointly an international workshop on soil potassium and K fertilizer management in Zhuhai City, Guangdong Province, China on November 13-15, 2006. For more details please contact IPI Coordinator in China, Dr. Svetlana Ivanova, at Svetlana.Ivanova@uralkali.com. More details on the web at www.ipipotash.org

22-25 November 2006, Punjab Agriculture University (PAU), Ludhiana, Punjab, India:

International Symposium on Balanced Fertilization for Sustainability of Crop Productivity. This symposium will provide a platform for scientists and government agencies to share new knowledge, information, ideas and techniques and evolve new strategies for promoting balanced fertilization to the researchers and extensionists interested in varied aspects of plant nutrition. For more details contact IPI Coordinator India, Dr. Patricia Imas, at patricia.imas@ipipotash.org. More details on [our website](http://www.ipipotash.org).

26-30 November 2006, Irbid, Jordan:

The 2nd IPI-JUST-NCARTT training course on fertigation, a 5 day full training program. The objective is to provide a hands-on training on fertigation. The participants are expected after training to install a complete fertigation system and run any fertilization formula. They are also expected to get involved directly in the field work. Please contact IPI WANA Coordinator, Prof. Munir Rusan, at mrusan@just.edu.jo. Please also see at www.ipipotash.org

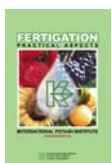
New publications



Potash fertilizers: Towards higher yields of rice (in Bangla). 6 p. 2005. Available for download at [IPI website](http://www.ipipotash.org).



Fertigation, Practical aspects. 8 p. 2005. Available for download at [IPI website](http://www.ipipotash.org).



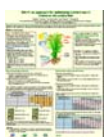
Fertigation (in Chinese). 2006. Dr. Chenglin Zhang. Published by the China Chemistry and Industry Press. Contact for hard copy: Dr. Chenglin Zhang, (clzhang@scau.edu.cn), College of Resources and Environment, South China Agricultural University, Guangzhou, 510640, PR China; Tel: 86-20-85281822. More details at www.ipipotash.org.

IPI offered financial support for this publication.

New Publications



Effect of secondary nutrients application on a long-term yield of two crop sequences in Pampean Argentina. 2006. R. Melgar, H. Magen, P. Imas, F. Salvagiotti, R. Melchiori, E. Lovera, A. Bono and H. Echeverria. A poster presented by E. Melgar at the 18th World Congress of Soil Science, July 9-15, 2006 in Philadelphia, USA. Available for download at www.ipipotash.org.



SSNM: An approach for optimizing nutrient use in intensive rice production. 2006. Roland J. Buresh, Christian Witt, and Mirasol F. Pampolino. Poster presented at the IFA Agriculture Conference in Kunming, China, February 2006. Available for download on our [website](http://www.ipipotash.org).



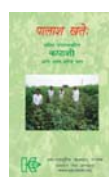
Application of compound NPK fertilizers for sugar beet / Recommendations of Research Institute for Soil Science and Agrochemistry of National Academy of Sciences of Belarus and International Potash Institute (in Russian). 28 p. 2006. The new types of compound NPK fertilizers with additives of micronutrients and biologically active substances are recommended for sugar beet. The fertilizer use efficiency in relation to yield response, quality of sugar beet production and economic net return values are considered in this publication. Check our [website](http://www.ipipotash.org).



Application of compound NPK fertilizers for winter rape seed / Recommendations of the Research Institute for Soil Science and Agrochemistry of the National Academy of Sciences of Belarus and the International Potash Institute (in Russian). 24 p. 2006. The recommendations are devoted to the application of new types of compound NPK fertilizers with additives of micronutrients and biologically active substances for winter rape seed. Efficiency of fertilizer use with respect to rape seed yield increase and economic net return values are considered in this publication. Available at www.ipipotash.org.



Peculiarities of fodder bean crops cultivation on radioactive contaminated soils (in Russian). 40 p. 2005. Edited by I.M. Bogdevitch, Minsk, BRISSA, IPI. This publication considers the selection of the appropriate soils and fertilization for growing pea, lupine, vetch and their mixtures as fodder crops on land contaminated with radionuclides. The effective methods of reducing the ^{137}Cs and ^{90}Sr accumulation in fodder are recommended. Available at [IPI website](http://www.ipipotash.org).



Potash Fertilizers Towards Higher yields of Cotton and Better Fibre Quality (in Marathi). 6 p. 2005. Available for [download](http://www.ipipotash.org) on our website.



Fertigation (in Arabic). 2005. Prof. Munir Rusan (JUST), Dr. Waleed Qawasmi (NCARTT) and Eng. Said Zuraiqi (NCARTT). Contact person: Munir Rusan. mrusan@just.edu.jo. Publisher: Jordan University of Science and Technology (JUST) and the National Center for Agricultural Research and Transfer of Technology (NCARTT). The bulletin summarizes all aspects of fertigation: Requirements for setting up a fertigation program; estimation of the water and nutrient requirements of the crops; solved examples/problems; selection of fertilizers for fertigation and preparation of fertilizer solutions; comparisons among different fertilizer injectors; calculations, using examples, of the necessary fertilizers for different fertilization recommendations; practical recommendations; and appendices/tables summarizing nutrient requirements, fertilizer recommendations of some crops and some conversion factors. See at [IPI website](http://www.ipipotash.org).



Potassium and its Importance in Agriculture, Eskisehir Turkey 2005 (in Turkish). 213 p. 2006. IPI-Ege University-Bornova-Izmir-Turkey, National workshop, 3-5 October, 2005, Eskişehir, Turkey. Prof. Dr. Dilek Anaç, Prof. Dr. Nevin Eryüce, Prof. Dr. Bülent Okur (eds.). Available for download at www.ipipotash.org.

Publications by the PDA

What is the PDA (Potash Development Association)?



The Potash Development Association is an independent organisation formed in 1984 to provide technical information and advice in the UK on soil fertility, plant nutrition and fertilizer use with particular emphasis on potash. See also <http://www.pda.org.uk/>.



#29. Potash and the Environment

The use of potash does not have an environmental downside, but lack of K can reduce efficient plant uptake of N and P. This leaflet looks at the issues, including cross-compliance and good practice. [See PDA website.](#)



#18. Grain legumes need potash

Summarises new research findings on the potash needs of beans, peas and other grain legumes which provide important new information for anyone growing these pulse crops. [See PDA website.](#)



#28. Why maintain soil potash reserves?

A recap on soil fertility maintenance and other issues related to potash use on cereals by a leading Rothamsted soil scientist. [See PDA website.](#)



#13. Oilseed rape and potash

Requirements of potash for oilseed rape including recommendations and timing of application. [See PDA website.](#)



#22. NK arable top dressing

Reviews the pattern of nutrient uptake and removal by arable crops and details a practical approach for optimum timing of potash application. [See PDA website.](#)

K in the literature

In the old times - remember 'Research Findings'? This was a section of our veteran *ifc*, which was a collation of research papers on various issues related to K. With current information technology capabilities, IPI is able to share with our readers the newly adopted citation tools. We have received permission from various publishers in Argentina, China, Germany, India, Pakistan, Switzerland, Sweden and the USA to display the latest papers on K, selected by us, on our website. This will include the abstracts and full citation. Please go to <http://www.ipipotash.org/literature/>

and search in our database. It is all about K – and it is updated regularly with every new edition of the journals we cover!

As an example, and 'appetizer', we present here a paper titled Spatial and Temporal Variability of N, P and K Balances for Agroecosystems in China,

by SHEN Run-Ping, SUN Bo and ZHAO Qi-Guo, published in *Pe-dosphere* 15(3):347-355 (2005).

Abstract: Nitrogen, phosphorus, and potassium balances for agroecosystems in China from 1993 to 2001 were calculated at national and provincial levels using statistical data and related parameters, and their spatial and temporal variabilities were analyzed with GIS to estimate the potential impacts of nutrient N, P and K surpluses or deficits to soil, water and air. At the national scale, the N and P balances from 1993 to 2001 showed a surplus, with the nitrogen surplus remaining relatively stable from 1997-2001. Although during this period the P surplus pattern was similar to N, it had smaller values and kept increasing as the use of phosphate fertilizer increased year by year. However, K was deficient from 1993 to 2001 even though from

1999 to 2001 the K deficit decreased. The spatial analysis revealed higher N surpluses in the more developed southeastern provinces and lowest in the western and northern provinces where there was less chemical fertilizer input. The serious K deficit mainly occurred in Shanghai and Beijing municipalities, Jiangsu, Zhejiang and Hubei provinces, and Xinjiang autonomous regions. For the years 1992, 1996 and 2001, N surpluses and K deficits had significant positive spatial correlations with per capita gross domestic product (GDP), per capita gross industrial output value, and per capita net income of rural households. This showed that the level of economic development played an important role in determining nutrient balances in the agroecosystems.

For more K literature go to www.ipipotash.org/literature/



Do we know what we ought to know?

Have we mapped and identified the gaps in our knowledge – and further the means and ways to close these gaps? The “K for thought” section brings you a brief look at developing issues and topics that may have an impact on nutrient management and that we would like to share with you. Trying to close the gaps...

Most people prefer meat in their diet;

of the ~2740 kcal/day needed for optimal nutrition, 700 kcal should come from animal products. Taking these assumptions and linking them with the forecasted population growth, the world will need ~3.6 billion tonnes of cereal. Nitrogen, a key factor in boosting cereal yields is essential to fuel this growth. Read more about world population and food supply at [Gilland, 1998](#) and at [IFPRI](#).

Biofuels have become a strong

consumer for crop production: Sugarcane and maize supply ethanol, rapeseed oil and palm oil supply biodiesel. The FAO also lists fuel-wood as an important source of future bioenergy. In April (2006), Alexander Müller, the new Assistant Director-General for the Sustainable Development Department of

FAO stated that “The gradual move away from oil has begun. Over the next 15 to 20 years we may see biofuels providing a full 25 percent of the world’s energy needs.” FAO’s interest in bioenergy stems from the positive impact that energy crops are expected to have on rural economies and from the opportunity offered to countries to diversify their energy sources. How will this development affect prices of food and nutrient demand? Read more at:

Demand for Ethanol May Drive Up Food Prices: Science News [Online](#)

Ethanol Production Using Corn, Switchgrass, and Wood: 2005; Biodiesel Production Using Soybean and Sunflower: Natural Resources Research, Volume 14, Number 1, David Pimentel and Tad W. Patzek. Abstract at [Springerlink](#).

The Billion-Ton Biofuels Vision. Editorial by Chris Somerville, Science, V.312, 2 June 2006, p. 1277. (<http://www.sciencemag.org/>).

USDA report: Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply ([USDA](#)).

Africa Fertilizer Summit in Abuja,

9-13 June, 2006. Why is food production so low in Africa? The reasons are many: Low labor and land productivity, very low inputs of fertilizers (ca 8 kg/ha/year), poor policies, large human disease load, large rural inland population with very poor infrastructure, and with low impact of the Green Revolution; all these contribute to the poor situation of the continent. Quote from the Abuja Declaration: “Due to decades of soil nutrient mining, Africa’s soils have become the poorest in the world. It is estimated that the continent loses the equivalent of over \$4 billion worth of soil nutrients per year, severely eroding its ability to feed itself.”

See more: Presentations from Dr. Amit Roy, Dr. Norman Borlaug, Dr. Pedro Sanchez, Dr. Eric Smaling, Dr. Jeffrey Sachs and others are found at [Africa Fertilizer Summit](#).

Clipboard

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(seap@seap.sg) indicating that you would like to join the mailing list.

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Want to be updated on new items added to the IPI web site? Try the RSS. Go to <http://www.ipipotash.org/rss.html> and learn more.

Comments? Suggestions? We would appreciate to receive your feedback. Please email ipi@ipipotash.org.

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