

# **36th Biennial Meeting of the American Society of Sugar Beet Technologists 2011**

**Albuquerque, New Mexico, USA  
2-5 March 2011**

**Volume 1 of 2**

**ISBN: 978-1-61839-077-6**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2011) by the American Society of Sugar Beet Technologists  
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the American Society of Sugar Beet Technologists  
at the address below.

American Society of Sugar Beet Technologists  
800 Grant Street, Suite 300  
Denver, Colorado 80203-2944

Phone: 303-832-4460  
Fax: 303-832-4468

[www.bsdf-assbt.org](http://www.bsdf-assbt.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

Volume 1

## GENERAL SESSION

<b>Climate Policy Impacts on Beet Sugar</b> .....	1
<i>Janet M. Anderson</i>	
<b>A Whole New Agribusiness World</b> .....	14
<i>Jim Wiesemeyer</i>	
<b>The Journal of Sugar Beet Research of the ASSBT - A Clearing House for the Exchange of Ideas</b> .....	29
<i>Lee Panella, Larry G. Campbell, J. Mitchell McGrath, John Lambert</i>	

## AGRICULTURAL AND OPERATIONS - ORAL PRESENTATIONS

### SECTION A – AGRONOMY

<b>Nitrogen Use Management in Sugar Beet Culture As Related to Soil Type as Well as Timing of Application</b> .....	44
<i>David M. Elison, Greg Dean</i>	
<b>Effect of Tillage and Nitrogen Fertilizer Rate on Sugarbeet Production</b> .....	97
<i>David D. Tarkalson, Dave L. Bjorneberg</i>	
<b>Where Does Turkey Litter Fit with Sugarbeet Production?</b> .....	118
<i>John A. Lamb, Mark W. Bredehoeft, Chris Dunsmore</i>	
<b>Nitrogen Rate Effect on Sugar Beet Stands in Strip Tillage</b> .....	119
<i>Robert W. Downard, David Elison</i>	
<b>Shank Operating Depth for Zone Tillage</b> .....	120
<i>John A. Smith</i>	
<b>Preemergence Ethofumesate Increases Postemergence Spray Retention on Common Lambsquarters</b> .....	181
<i>Andrew R. Kniss, Dennis C. Odera</i>	
<b>Comparison of Adjuvants Used with Glyphosate for Weed Control in Sugar Beets</b> .....	182
<i>Don W. Morishita, J. Daniel Henningsen, Donald L. Shouse</i>	
<b>Volunteer Glyphosate-resistant Corn Control and Interference in Glyphosate-resistant Sugarbeet</b> .....	183
<i>Robert G. Wilson, Gustavo M. Sbatella, Andrew R. Kniss</i>	
<b>Management of Giant Ragweed in Glyphosate-resistant Sugarbeet with Clopyralid</b> .....	184
<i>Jason M. Fisher, Jeff M. Stachler, John L. Luecke</i>	
<b>Production Response of Sugarbeet Breeding Lines to Deficit Irrigation</b> .....	186
<i>David D. Tarkalson, Imad Eujayl, Brad King</i>	
<b>Development of Season Long Deficit Irrigation Strategies for Sugarbeets</b> .....	213
<i>C. D. Yonts</i>	
<b>Agronomic Research Experiences with Emergence Enhancement Treatments in Alberta</b> .....	220
<i>Peter J. Regitnig, Bryan R. Avison, Jennifer Nitschelm</i>	
<b>Variety Approval “Points” System Based Upon Yield, Quality, Emergence and Resistance Traits</b> .....	222
<i>James F. Stewart, Lee A. Hubbell, Greg M. Clark, Brian Groulx</i>	
<b>Effect of Late-season Glyphosate on Glyphosate-resistant Common Ragweed</b> .....	256
<i>Jeff M. Stachler, John L. Luecke</i>	
<b>Benchmark Study: Impact of Glyphosate-resistant Crops on Weed Populations, Weed Management Tactics, and Farm Profitability - Can This Study Provide Insight Into the Future of Glyphosate-resistant Sugarbeets?</b> .....	258
<i>Robert G. Wilson, Stephen C. Weller, David R. Shaw, Micheal D. K. Owen, Bryan G. Young, David L. Jordan</i>	
<b>Weed Management in Genuity® Roundup Ready® Sugarbeet</b> .....	259
<i>Ryan K. Bartlett</i>	
<b>Nutrient Deficiencies in Glyphosate-resistant Sugar Beets?</b> .....	260
<i>Bernd Holschulte, Gary Korbel, Jay Miller</i>	
<b>Evaluation of In-furrow Products to Enhance Sugarbeet Production</b> .....	266
<i>Mark Bredehoeft, Chris Dunsmore</i>	
<b>Influence of Starter Fertilizer on Optimum Nitrogen Rate</b> .....	271
<i>John A. Lamb, Mark W. Bredehoeft, Chris Dunsmore</i>	

<b>Effect of Variable Rate Seeding on Sugarbeet Production</b> .....	272
<i>Lynn Dusek, Curtis Funk, Joe Hastings, Allan Cattanach</i>	
<b>Rhizoctonia Solani; the Extent of the Problem and Control Measures in Michigan</b> .....	273
<i>Lee A. Hubbell, James F. Stewart, Brian J. Groulx, Ralph Fogg, Greg M. Clark</i>	

## **SECTIONS B & E – PHYSIOLOGY, BIOTECHNOLOGY, GENETICS AND GERMPLASM**

<b>Development of a Polysaccharide-modifying Enzyme for Beet Pulp Processing</b> .....	309
<i>Brett J. Savary, Prasanna Vasu, Jose C. Tovar</i>	
<b>Jasmonic Acid and Salicylic Acid Inhibit Growth of Three Sugarbeet Storage Rot Pathogens</b> .....	310
<i>Karen Klotz Fugate, Jocleita P. Ferrareze, Melvin D. Bolton</i>	
<b>Changes in Viability and Germination Speed of Primed Sugar Beet Seed During Storage</b> .....	311
<i>Rafal Marcinek, Chris Marrow, Stephen Harper</i>	
<b>Analysis of the Breeding Progress of Sugar Beet</b> .....	317
<i>Jens Loel, Christine Kenter, Bernward Maerlaender, Christa Hoffmann</i>	
<b>Overview of Breeding and Enhancement Activities at East Lansing, Michigan</b> .....	337
<i>J. Mitchell McGrath, Linda E. Hanson</i>	
<b>DArT Based Genetic Linkage Map of Sugarbeet and Mapping of Beet Curly Top</b> .....	342
<i>Imad A. Eujayl, Carl A. Strausbaugh, Wolfgang Michelke, Dietrich Borchardt, Andrzej Kilian</i>	
<b>Screening Sugar Beet Germplasm for Resistance to Rhizoctonia Solani in Artificially Induced Field Epiphytotics: Examining 25 Years of Data</b> .....	343
<i>Lee Panella</i>	
<b>Liquefied Sugar Beet - The Ideal Fermentation Substrate for Your Bio-based Products</b> .....	344
<i>Ulrich Kettling, Irina N. Sterr</i>	

## **SECTION C – ENTOMOLOGY & PLANT PATHOLOGY**

<b>Introducing CruiserMaxx Sugar Beets: A Comprehensive Seed Care Product Concept for Broad Spectrum Disease and Insect Protection for Sugar Beets</b> .....	345
<i>Kiran Shetty, Chad Selton</i>	
<b>The Journey from Catastrophe to Success</b> .....	346
<i>Mohamed F. R. Khan</i>	
<b>Managing Sugarbeet Insect Pests with Seed Treatment Insecticides</b> .....	347
<i>Mark A. Boetel, Ayanava Majumdar, Robert J. Dregseth, Allen J. Schroeder</i>	
<b>Variation in the p25 Region of Resistance Breaking Beet Necrotic Yellow Vein Virus from Infected Plants in Minnesota</b> .....	348
<i>Madeleine J. Smith, Charles Rush</i>	
<b>Impact of Curly Top Host Plants on Accumulation, Competitiveness, and Durability of Curtovirus Species</b> .....	375
<i>William M. Wintermantel</i>	
<b>Rhizoctonia Seedling Damping-off in Sugar Beet in Michigan</b> .....	377
<i>Linda E. Hanson, J. Mitchell McGrath</i>	
<b>Application Strategies Utilizing Quadris™ Fungicide for Control of Rhizoctonia Solani Root Rot on Sugarbeets with Natural Infection</b> .....	378
<i>Steven S. Poindexter, Thomas J. Wenzel</i>	
<b>Effect of Penthiopyrad As a Seed Treatment for Controlling Rhizoctonia Solani on Sugar Beet</b> .....	380
<i>Mohamed F. R. Khan, Aaron L. Carlson</i>	
<b>Optimization of Sugar Beet Rhizoctonia Solani Resistance Test in Field Trials by Irrigation and Fleece Cover</b> .....	381
<i>Christinea Dircks, Anneke Behn, Mark Varrelmann</i>	
<b>Aggressiveness of Rhizoctonia Solani AG 2-2 on Sugar Beet and Rotation Crops</b> .....	382
<i>Carol E. Windels, Jason R. Brantner</i>	
<b>Efficacy of In-furrow and Post-emergence Fungicides in Controlling Rhizoctonia on Sugar Beet</b> .....	406
<i>Jason R. Brantner, Carol E. Windels</i>	
<b>Effect of Fungicides on Disease Control, Yield and Quality of Sugar Beet Inoculated with Different Sources of Cercospora Beticola Inocula</b> .....	439
<i>Mohamed F. R. Khan, Aaron L. Carlson, Gary A. Secor, Viviana V. Rivera, Melvin D. Bolton</i>	
<b>Correlating Reduction in Fungicide Sensitivity in C. Beticola with Loss of Disease Control</b> .....	440
<i>Gary A. Secor, Melvin D. Bolton, Viviana V. Rivera, Mohamed F. R. Khan</i>	

<b>Cultivar Selection for Sugarbeet Root Rot Resistance</b> .....	459
<i>Carl A. Strausbaugh, Imad A. Eujayl, Paul Foote</i>	
<b>Mycotoxigenic Potential and Pathogenicity of Fusarium Species Isolated from Sugar Beet</b> .....	461
<i>Daniela Christ, Mark Varrelmann</i>	
<b>Characterization of the Genetic Diversity of Fusarium Oxysporum F. Sp. Betae Utilizing Phylogenetic Analysis and Vegetative Compatibility Grouping</b> .....	462
<i>Kimberly M. Webb, Amy L. Hill, Linda E. Hanson, Lee Panella, Mark Brick, Howard Schwartz</i>	
<b>Root Aphid Tolerance in Sugar Beet; Field Screening &amp; Resistance Mapping</b> .....	463
<i>Roy Martens, Geert Janssen, Thomas Kraft, Rebecca Larson</i>	
<b>Biological and Molecular Characterization of Beet Oak-leaf Virus</b> .....	464
<i>Hsing-Yeh Liu, Anju Gulati-Sakhuja</i>	
<b>Efficacy of Fungicides for Controlling Rhizoctonia Solani on Sugar Beet</b> .....	465
<i>Mohamed F. R. Khan, Aaron L. Carlson</i>	
<b>Influence of Variety Tolerance, Application Timing and Fungicide Efficacy on Control of Cercospora Leafspot in Michigan</b> .....	483
<i>Ralph Fogg, James F. Stewart, Lee A. Hubbell, Brian Groulx, Greg M. Clark</i>	
<b>PCC for Enhancement of Sugar Beet Production and Evaluation of Rhizoctonia Disease Suppression</b> .....	526
<i>Mark Bredehoeft, Chris Dunsmore</i>	
<b>Fungicide and Insecticide Seed Treatments: Effects on Stands, Yields and Disease Control</b> .....	532
<i>Barry J. Jacobsen, Ken Kephart, Joyce Eckoff</i>	

## **SECTION D – CHEMISTRY, INSTRUMENTATION**

<b>Potential Savings from Sugar Defoamer Flow Monitoring and Display</b> .....	533
<i>Jon Murnik, Mike Thompson</i>	
<b>Color Formation in White Beet Sugars</b> .....	549
<i>Marianne L. McKee, Ronnie Triche, Mary An Godshall, Charley Richard</i>	
<b>Distribution of Non-sugars in the ARi Coupled Loop Molasses Desugarization System</b> .....	556
<i>D. E. Rearick, Cheri McKay, Alla Bagramyan</i>	
<b>Dietary Sugars and Diet Quality</b> .....	562
<i>Charles W. Baker</i>	
<b>Successful Application of Dextranase in Sugar Beet Factories</b> .....	603
<i>Gillian Eggleston, Andy Dilks, Mike Blowers, Kevin Winters</i>	
<b>The Measurement of Mannitol in a Sugar Beet Factory to Monitor Deterioration and Processing Problems</b> .....	655
<i>Gillian Eggleston, Jean-Marc Huet</i>	

Volume 2

## **SECTION F - FACTORY OPERATIONS**

<b>New Approach to Sugar Drying and Cooling</b> .....	687
<i>Hartmut Hafemann, Reinhold Hempelmann</i>	
<b>Novel Design of a Continuous Centrifugal and Its Operational Benefits</b> .....	717
<i>Irma Geyer, Hans J. Schmidt</i>	
<b>Influence of Sugar End Syrup pH on Overall Color Rise in the Sugar End and Color of Molasses Produced</b> .....	741
<i>Christopher D. Rhoten</i>	
<b>Cossette Quality and the Impact This Has on Factory Operations</b> .....	749
<i>Galan M. Rogers</i>	
<b>Biobased Products: Opportunities and Challenges in the Sugar Industry</b> .....	793
<i>Arvind Chudasama</i>	
<b>Pneumatic Conveying in Sugar Production</b> .....	794
<i>Jonathan Thorn</i>	
<b>Influence of Thin Juice pH Management on Thick Juice Color in a Factory Utilizing Weak Cation Thin Juice Softening</b> .....	799
<i>Christopher D. Rhoten</i>	
<b>Process Solids Separation on Raw Juices</b> .....	808
<i>Blake Klinger</i>	

<b>Results and Experiences with the New Putsch PKF NG</b> .....	809
<i>Chris L. Patullo</i>	
<b>Utilization of Beet Sugar Factory Resources for Production of Algal Biodiesel</b> .....	823
<i>Vadim Kochergin, Mark Suhr, Christian Lohrey</i>	
<b>Design of Clarifiers with Turbulence Reduction Devices</b> .....	824
<i>Vadim Kochergin, Cy Gaudet</i>	
<b>Restoring the Operational Capacity of a Coupled-loop Molasses Desugarization Separator</b> .....	825
<i>David Groom, Heather Jarski, Terry McGillivray, Mike Goettel</i>	
<b>Solids Removal from the Flume Water System Phase V</b> .....	833
<i>Galan M. Rogers, Thomas T. Dolecheck, Karen M. Cummings</i>	
<b>Performance of Factory Anaerobic Contactors Operated with and Without Pre-acidification (PA) of Feed to the Contactors and Comparison to Bench PA Trials</b> .....	857
<i>Indrani S. Samaraweera, Terry McGillivray, Mike Goettel, Sheldon Seaborn, Dennis Burthwick</i>	
<b>A Comparison of Anion Concentrations Across Carbonation at the Five Valley Factories of American Crystal Sugar Company</b> .....	871
<i>Heather R. Jarski, Terry D. McGillivray</i>	
<b>Determination of Oleanolic Acid Based Saponin Removal by the Wastewater Treatment System at Southern Minnesota Beet Sugar Cooperative</b> .....	876
<i>Louis H. Knieper, Ron Kawlewski, Jeffrey L. Carlson</i>	
<b>Strong and Flexible Thermal and Environmental Coupling Between Pulp Drying and Sugar Process</b> .....	880
<i>Olivier Vidal, Olivier Deur</i>	
<b>Initial Results and First Impressions with the Turbofilter</b> .....	909
<i>Marcelo Moreira De Silva, Eduardo Ieda</i>	
<b>Steam Drying of Beet Pulp in Japan and Latest Development of the Technology</b> .....	910
<i>Kasper Gehl Larsen, Fumio Kikuchi, Arne S. Jensen</i>	
<b>Additives and Processing Aids Evolving Requirements for Food Safety</b> .....	918
<i>Frank J. Magazine, Julie Vaughn Biege, Omar Fuentes, Eric Keyes</i>	
<b>Clarification of High Strength Wastewater Using Dissolved Air Floatation Technology</b> .....	927
<i>Gary Cornelius, Glenn Augustine, Todd Maurice, Ron Kawlewski</i>	

## **AGRICULTURAL PROCEEDINGS – POSTERS**

### **SECTION A – AGRONOMY / POSTERS**

<b>Management of Unharvested Sugar Beet in Alberta</b> .....	947
<i>Bryan R. Avison, Peter J. Regitnig</i>	
<b>Respiratory Losses in Sugar Beets As a Function of Storage Temperature, Field Nitrogen Application, Sprouting Incidence and Handling Severity</b> .....	950
<i>Randolph Beaudry, Ron Gehl, James Stewart, Lee Hubbell</i>	
<b>Four Years of Strip Tillage in a Wheat-Beet-Bean-Corn Rotation in ND and MN</b> .....	951
<i>Norman Cattanaach, Laura Overstreet</i>	
<b>Evaluate Nitrogen Rates, Application Timings and Application Methods for Sugarbeets in Michigan</b> .....	952
<i>Greg M. Clark, James F. Stewart, Lee A. Hubbell, Ralph Fogg, Brian Groulx</i>	
<b>Managing Nitrogen Fertilizer for Maximum Returns of the Sugar Beet Crop, As Related to Soil Type</b> .....	957
<i>Greg A. Dean, David M. Elison</i>	
<b>Scalped Vs. Non-scalped Sugarbeets</b> .....	960
<i>J. L. A. Eckhoff, J. W. Bergman, C. R. Flynn</i>	
<b>Effect of Row Width and Population on Sugar Beet Yield and Quality</b> .....	962
<i>Brian J. Groulx, Lee A. Hubbell, James F. Stewart, Greg Clark</i>	
<b>Effect of Manure Compost on Sugar Beet Yield and Quality</b> .....	967
<i>Gary W. Hergert, Rex A. Nielsen</i>	
<b>Volunteer Glyphosate-resistant Soybean Management in Glyphosate-resistant Sugarbeet</b> .....	971
<i>Gary E. Powell, Christy L. Sprague</i>	
<b>The Effect of Nitrogen and Time of Weed Removal on Sugarbeet Yield and Quality in Glyphosate-resistant Sugarbeet</b> .....	972
<i>Alicia J. Spangler, Christy L. Sprague, Darryl D. Warncke</i>	
<b>Cover Crops and Reduced Tillage in Glyphosate-resistant Sugarbeet</b> .....	973
<i>Christy L. Sprague, Gary E. Powell, Erin C. Taylor</i>	
<b>Effects of Phosphorus Placement and Rate on Sugarbeet Production</b> .....	974
<i>David D. Tarkalson, Dave L. Bjerneberg</i>	

<b>Impact of Reduced Nitrogen Management in Sugar Beet Production on Silt Loam Soils in the Grande Ronde Valley of Eastern Oregon</b> .....	975
<i>Bill Wahlerl, Greg Dean, David M. Elison</i>	
<b>Influence of Different Brands of Glyphosate and Spray Adjuvants on Weed Control and Sugarbeet Performance</b> .....	978
<i>Robert G. Wilson, Gustavo M. Sbatella</i>	

**SECTIONS B & E – PHYSIOLOGY, BIOTECHNOLOGY, GENETICS AND GERMPLASM/POSTERS**

<b>Storage Comparison for Beets on and in a Storage Building Beet Pile</b> .....	979
<i>Murray S. Bullock, Duane Pearson, Dan Bjur</i>	
<b>New Additions to the National Plant Germplasm System’s Beta Collection: Southern Morocco Expedition</b> .....	980
<i>Barbara C. Hellier, Lee Panella, Yasmina El Bahloul, Naima Qariouh</i>	
<b>Metabolic Changes Associated with Elevated Respiration Rate in Stored Sugarbeet Roots After Injury</b> .....	983
<i>Abbas M. Lafta, Karen Klotz Fugate</i>	
<b>Sugar Beet Root Maggot (Tetanops Myopaeformis) Genes Modulated by Resistant and Susceptible Interactions with Beta Vulgaris</b> .....	985
<i>Haiyan Li, Senthilkumar Padmanaban, Ann C. Smigocki, Larry Campbell</i>	
<b>Examining Salt Stress for Improvement of Seedling Vigor</b> .....	991
<i>Raymond S. Lindsey, J. Mitchell McGrath</i>	
<b>Speed and Uniformity of Sugar Beet Seed Germination Determined by Automated Image Capture and Time Course Analysis</b> .....	995
<i>Jordan Long, Heather Webb, Stephen Harper</i>	
<b>Sugar Beet (Beta Vulgaris L.) Promoters for Directed Tissue-specific Root Transcription</b> .....	996
<i>Senthilkumar Padmanaban, Haiyan Li, David P. Puthoff, Ann C. Smigocki</i>	
<b>Biochemical and Proteomic Profiling of Beta Vulgaris Root Proteins to Identify Cell Wall Polysaccharide-modifying Enzymes</b> .....	1002
<i>Brett J. Savary, Prasanna Vasu, Dayanandan Anandan, Ann C. Smigocki</i>	
<b>Induced Resistance to Beet Curly Top Virus</b> .....	1003
<i>William M. Wintermantel</i>	

**SECTIONS C – ENTOMOLOGY AND PLANT PATHOLOGY / POSTERS**

<b>Mechanisms of DMI Resistance in Field Isolates of Cercospora Beticola</b> .....	1005
<i>Melvin D. Bolton, Gary A. Secor, Viviana V. Rivera, Keshav Birla</i>	
<b>Impact of Soil, Hydrologic, and Production-system Variability on Sugarbeet Root Aphids</b> .....	1006
<i>Jeff D. Bradshaw, C. Dean Yonts, Drew J. Lyon, John A. Smith</i>	
<b>Rhizoctonia Belly Rot in Cucumber Fruit Using Rhizoctonia Solani Isolated from Sugar Beet</b> .....	1011
<i>Thomas R. Goodwill, Linda E. Hanson</i>	
<b>Postharvest Rhizopus Rot on Sugar Beet</b> .....	1012
<i>Linda E. Hanson, In Young Cho, Subashini Nagendran</i>	
<b>Determining Optimal Fungicide Timing for Rhizoctonia Root Rot of Sugar Beets in Nebraska Based on Soil Temperatures</b> .....	1013
<i>Robert M. Harveson, Kathleen A. Nielsen, C. Clay Carlson</i>	
<b>A Rare Epidemic of Sugar Beet Seedling Rust in Nebraska</b> .....	1016
<i>Robert M. Harveson</i>	
<b>Effect of Depth of Inoculum Placement on Development of Rhizoctonia Solani on Sugar Beet</b> .....	1019
<i>Mohamed F. R. Khan, Somwattie P. Desouza, Jacob L. Wildman, Aaron L. Carlson</i>	
<b>What is the Best Time to Control Rhizoctonia Root Rot of Sugar Beet?</b> .....	1020
<i>Mohamed F. R. Khan, Somwattie P. Desouza, Jacob L. Wildman, Aaron L. Carlson</i>	
<b>Field Strip Trial Evaluation of Seed Treatment Insecticides in the Red River Valley</b> .....	1021
<i>Michael S. Metzger, Tim Kenyon, Neil Boedekker, Tom Hermann, Chris Motteberg, Lynn Dusek, Curtis Funk, Allan Cattana</i>	
<b>Aerial Imaging to Assess Rhizoctonia Crown and Root Rot Severity in Sugar Beet Fields</b> .....	1027
<i>Ian V. Macrae, Gregory J. Reynolds, Albert L. Sims, Carol E. Windels, Soizik Laguette</i>	
<b>Remote Sensing for Assessing Rhizoctonia Crown and Root Rot Severity in Sugar Beet</b> .....	1028
<i>Gregory J. Reynolds, Carol E. Windels, Ian V. Macrae, Soizik Laguette</i>	

<b>Mating Type Idiomorphs Distribution and Their Correlation to Benzimidazole-resistance in <i>Cercospora Beticola</i> from the Central High Plains Region, USA</b> .....	1029
<i>James O. Obuya, Linda E. Hanson, Gary D. Franc</i>	
<b>Fungicide Trials for the Control of <i>Erysiphe Polygoni</i> Causal Agent of Powdery Mildew on Sugar Beets in Idaho</b> .....	1032
<i>Oliver T. Neher, Tamara Keeth</i>	
<b>Integrated Pest Management Approaches for the Control of <i>Erysiphe Polygoni</i>, Causal Agent of Powdery Mildew on Sugar Beets in Idaho</b> .....	1034
<i>Oliver T. Neher, Tamara Keeth</i>	
<b>Neonicotinoid Seed Treatments and Foliar Sprays on Sugarbeet for Control of Severe Curly Top</b> .....	1036
<i>Carl A. Strausbaugh, Imad A. Eujayl, Erik Wenninger</i>	
<b>Environmental Conditions That Contribute to Development and Severity of Sugar Beet Fusarium Yellows Caused by <i>Fusarium Oxysporum</i> F. Sp. Betae: Temperature</b> .....	1038
<i>Kimberly M. Webb, Tammy Brenner</i>	
<b>Effects of Herbicides and Sugarbeet Cultivars on <i>Rhizoctonia</i> Root and Crown Rot Development</b> .....	1039
<i>Tsering Youdon, Gary D. Franc, Andrew R. Kniss, William L. Stump</i>	

## **FORUMS**

### **FORUM – ENVIRONMENTAL - AIR QUALITY**

<b>Boiler Emissions Control Evaluation</b> .....	1042
<i>Dean Delorey</i>	
<b>Sustainability Programs Applications to Sugar Beet Processing Facilities</b> .....	1070
<i>Dean Delorey</i>	
<b>Green House Gases Emissions – The Dawn of Cap and Trade System</b> .....	1092
<i>Jelena Denin Djurdjevic</i>	
<b>US EPA Green House Gas Permitting Overview</b> .....	1104
<i>Shawn Sullivan</i>	
<b>EPA Regulations Impacting the Boiler House</b> .....	1125
<i>Steven Smock</i>	

### **FORUM – BEET STORAGE**

<b>Use of Clamps and the Ropa Maus at Southern Minnesota Beet Sugar Cooperative</b> .....	1145
<i>Todd Geselius</i>	
<b>Innovative Alternatives to Traditional Piling of Sugarbeets</b> .....	1151
<i>Keith Kalso</i>	

### **FORUM – OFFICIAL VARIETY TRAIL PARAMETERS**

<b>Variety Approval Forum Michigan Sugar</b> .....	1195
<i>Jim Stewart</i>	

### **FORUM – RHIZOCTONIA**

<b>Rhizoctonia Forum</b> .....	1221
<i>Jim Stewart</i>	
<b><i>R. solani</i> AG 2-2 Intraspecific Groups (ISG) IV and IIIB</b> .....	1252
<i>Carol E. Windels, Jason Brantner</i>	

### **FORUM – RHIZOCTONIA NURSERY TECH**

<b>Rhizoctonai Inoculation Techniques</b> .....	1272
<i>Jason Brantner, Carol Windels, Jeff Nielsen</i>	
<b>Rhizoctonia Nursery</b> .....	1297
<i>Lee Hubbell</i>	



**FORUM – TILLAGE SYSTEMS**

**Tillage Systems Forum** ..... 1314  
*John Smith*

**FORUM – WATER QUALITY**

**Sustainability Programs Applications to Sugar Beet Processing Facilities** ..... 1070  
*Dean C. Delorey*

**Whole Effluent Toxicity (WET) Testing and Evaluation** ..... 1325  
*Louis Knieper*

**Groundwater Discharge Impacts** ..... 1343  
*Steven Smock*

**Surface Water Discharge Limitations** ..... 1359  
*Shawn Sullivan*

**Author Index**