

CSA Newsletter

Canadian Society of Agronomy

July 2011



PRESIDENT'S MESSAGE

Dear Colleagues,

As I am writing this, preparations for the upcoming Plant Canada 2011 conference are in full swing. I hope to meet as many of you in Halifax as possible. It has been a challenging year for many of our members to securing funding to travel to the conference. The executive has had some lively discussions as to the reasons why this has been happening, including some restrictions that our colleagues in the Agriculture and Agri-Food Canada system are facing. This comes as no surprise, considering that production agriculture has taken a backstage these days, in spite of growing population and food demands around the world. It seems to me that there is a notion that all the issues, especially in regards to research in agricultural production, have been resolved, and that there is no further need for research in the area. Having a job directly related with production agriculture I beg to differ! It seems that the prevailing opinion these days is that all one needs to do is to go onto the internet and pull the answer to their question. In this era of technological advancement who needs physical evidence? Sad!

I spent a great part of last winter giving talks on the 4R principle of fertilizer use (22 of a total of 36) and attempting to dispel myths about all the new and “innovative” products that now flood the Canadian market. Seeking to find research on some of them is a fruitless exercise. Their claims are based on testimonials. But testimonials are stories, not scientific evidence. What worked for a person for reasons unknown may not work for everybody else. I recall the 22 experiments that Don Flaten and I carried in 2000 with the \$5.50 treatment for canola; the treatment was meant to help canola under severe conditions, i.e., stress due to drought or excessive moisture, or so we built the story. At one site at Elm Creek, Manitoba we had a spectacular response of 45% increase with the treatment and we even toured the site with the farmer cooperator, who was on his knees trying to ascertain where the benefit was coming from by examining plants from the treatment. Today, we still don't know! The treatment was two pennies thrown on the plots (which back calculates to \$5.50 per acre) and the benefit was only at that site, plus one at Herronton, Alberta where a significant increase of 18% (the yield went from 10.3 to 12 bushels/acre – a crop failure!). Imagine the impact of a testimonial from the farmer at Elm Creek!

This has prompted me to seek a partnership of CSA with the Certified Crop Advisors to organizing our annual conference in 2012. The CSA, as a scientific society, has an important role to play in disseminating results from our scientific research, as limited as it may have become these days, to agronomy practitioners and make sure that the value of this research is duly recognized. At the same time, our society members should be given an opportunity to gain an appreciation of the valuable contribution that CCAs are offering in today's agriculture. At the moment we have an agreement in principle between the two organizations and we will work out the details over the summer months. A tentative theme for the conference to be held in Saskatoon, “Technology Transfer in the 21st Century”, reflects the spirit of this cooperative effort that would involve members of the two organizations along with media and farmer guests that will shape the future requirements for our profession.

See you in Halifax!

Rigas Karamanos
President



Organic Cereal Breeding in Western Canada

Organic producers have been asking, for years, for organic varieties that meet their unique growing conditions. Are they any closer to getting what they want?

Organic producers currently use varieties bred for conventional systems. Many feel that these varieties, selected from research plots that receive synthetic fertilizers and are kept nearly weed free, may not be suited to organic production.

In the past, most breeders suggested that the improvements in disease resistance, shortened time to maturity, and greater yield more than make up for any difference in response to input levels.

A few cereal breeders have taken the organic challenge seriously. Researchers at the Universities of Saskatchewan, Alberta and Manitoba, have identified characteristics of varieties that did well under organic management. In general, varieties with early vigour (those that emerged and covered the ground quickly) were better competitors with weeds. Tall, leafy varieties often did well.

Selection criteria in the organic breeding programs include agronomic characters such as height, straw strength, yield, early maturity, and disease resistance; and quality characteristics such as test weight, milling, gluten strength and baking quality.

In 2010, the University of Manitoba and Agriculture and Agri-Food Canada Winnipeg researchers introduced a new model of plant breeding to the prairies: participatory wheat breeding. Participatory means that farmers participate as an integral part of the plant breeding process. This ensures that the research is relevant to farmers' needs by broadening the number of environments where selection is done.

Researchers are asking participants to seed a small area to one or more populations of wheat. Farmers remove the plants that they don't like and save seed from the rest. After several generations, this "negative selection" will result in populations adapted to their local conditions and management. Researchers hope that the populations will have more genetic diversity, and be more able to respond well to stress and variable environments, as well as more specifically suit the farmers' preferences.

So are Canadian prairie organic farmers getting closer to having cereal varieties bred for their unique management systems? It is a slow process, with research started in 2004 only now resulting in lines being proposed for registration. According to Stephen Fox, wheat breeder at Agriculture and Agri-Food Canada, Winnipeg, candidates are being entered into registration tests. According to Jennifer Mitchell-Fetch, oat breeder at the same facility, oat varieties may be ready for registration as early as 2013.

This article was written by Brenda Frick, member of the O-Team, on behalf of the OACC with funding provided by Canada's Organic Science Cluster (a part of the Canadian Agri-Science Clusters Initiative of Agriculture and Agri-Food Canada's Growing Forward Policy Framework). The Organic Science Cluster is a collaborative effort led jointly by the OACC, the Organic Federation of Canada and industry partners. OACC newspaper articles are archived at www.oacc.info one month after publication. For more information : 902-893-7256 or oacc@nsac.ca.

Canadian Organic Science Conference

February 21 - 23, 2012

Winnipeg, Manitoba

Join us in snow-sparkled
Winnipeg for the
Canadian Organic
Science Conference.

Topics include:

- Fertility Management
- Cereal Production
- Greenhouse Production
- Horticultural Field Crops
- Ecology and Environment
- High Value Fruit
- Livestock Management
- Social Sciences
- Policy Development
- Knowledge Transfer

Presentation Title &
Abstract Submission
November 15, 2011

Early Registration
January 9, 2012

For more information, see
www.oacc.info/cosc



Funded through the Canadian Organic Science Cluster and its partners



Agriculture and
Agri-Food Canada



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OF MANITOBA



The Best 2010 Agronomy Paper Award

The Canadian Society of Agronomy is pleased to announce that the following paper has been chosen as the Best 2010 Agronomy Paper in the Canadian Journal of Plant Science.

J M Livingstone, P. Seguin, M V Strömvik. 2010. An in silico study of the genes for the isoflavonoid pathway enzymes in soybean reveals novel expressed homologues. *Canadian Journal of Plant Science*, 2010, 90:453-469



Dr. Martina Strömvik

Abstract

The soybean [*Glycine max* (L.) Merr.] genome was recently sequenced, creating a wealth of genetic information. With the sequence, important genes can be located and the exact copy number identified. Many of these genes may be non-functional genes or pseudogenes. Currently, over a million redundant expressed sequence tags, (ESTs) from various tissues of soybean are available in public databases. An EST is a sequence representing a gene that is expressed within a specific tissue or during a particular developmental process in a plant.

An important group of genes in soybean are the ones coding for enzymes in the isoflavonoid pathway. Isoflavones, such as daidzein, genistein and glycitein are used by the plant for protection against diseases and as signal molecules in the symbiotic interaction with nitrogen-fixing bacteria. Recently, the nutraceutical industry has claimed that isoflavones offer several human health benefits.

To gain a better understanding of the extent of the isoflavonoid pathway, we identified the suite of expressed gene copies for five key enzymes in the soybean genome. Known gene sequences for these five enzymes were used to retrieve EST sequences from the public soybean genome. Contiguous sequences were assembled from the ESTs to represent the genes expressed and these were matched to the chromosome-based assembly of the soybean genome. While most of the genes identified had been found already, six novel gene copies were discovered. In addition, three non-expressed suspected pseudogenes were also identified in the genome. *In silico* (computer generated) expression profiles for all the genes identified in the isoflavonoid pathway were made.

If a specific isoflavone contributes enhanced disease protection, yield advantage, or human health benefits, the information we generated could be used to modify the concentration of different isoflavones in different plant tissues. To modify metabolic pathways, it is crucial to know: 1) how many genes in the pathway need to be modified; 2) in which tissues and organs the genes are expressed; 3) how many copies of the genes exist; and 4) the effect modification has on all tissues where the genes are expressed. Our results show how many copies there are of the genes for the five key enzymes in the metabolic pathway of isoflavones. The computer generated profile also gives us an idea of which genes are expressed in which key plant tissue. This information could be used to increase or decrease the concentration of specific enzymes, thereby, increasing or decreasing the concentration of specific isoflavones in different plant tissues.

The Best Paper Award will include free registration for Plant Canada 2011 Conference, part of the travel expenses paid, and a certificate of recognition. The corresponding author Dr. Strömvik has agreed to present an invited lecture on the award-winning paper in Plant Canada 2011 Conference in Halifax. Congratulations!

The Canadian Society of Agronomy also wishes to thank the following CSA members to serve on the Best Paper Award Committee: Alek Choo (Chair), Malcolm Morrison, Perry Miller, and Vaino Poysa.

CSA Corporate Sponsors 2011



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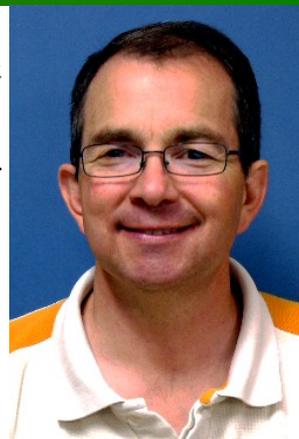
CWB



New CSA Executive Members for 2011-12

President Elect – Dr. Gavin Humphries

Gavin Humphreys is a Research Scientist and Wheat Breeder at Agriculture & Agri-Food Canada's Cereal Research Centre in Winnipeg. He holds a M.Sc. in forage breeding from the University of Guelph and a Ph.D. in oat breeding from McGill University. Gavin has been a member of the Canadian Society of Agronomy (CSA) for over 19 years. He has held the posts of Western Director (2003-2007) and Secretary/Treasurer (2007-2009) on the CSA Executive. Gavin is Secretary on the Plant Canada executive (2005-present). He has been an adjunct professor (2002-2009) at the University of Manitoba, and was Chair of the Canadian Wheat Cultivar Development Network (2000-2002). Gavin was co-organiser of the 2010 CSA Annual Meeting and organised the 2010 and 2011 CSA Borlaug Symposia. His research focuses on the development of improved varieties of Hard White spring wheat for western Canada and bread wheat (CWRS) adapted to the short season Northern prairies. He is primarily concerned with developing high-yielding varieties with improved pre-harvest sprouting resistance and end-use quality suitable for both baking and noodle markets. Gavin is a member of the Prairie Recommending Committee for Wheat, Rye and Triticale and coordinator of the Parkland Wheat Registration Test. To date, Gavin has registered or co-registered 14 wheat varieties. Gavin collaborated on 'Snowbird', the first Canada Western Hard White Spring wheat variety registered in Canada and 'Lillian' the hard red spring wheat variety with the greatest acreage in Canada over the past 5 years. Gavin has authored or co-authored 40 refereed publications on wheat genetics, molecular mapping and cereal quality.



Secretary/Treasurer – Dr. Pat Juskiw

Pat Juskiw, PhD., M.Sc., B.Sc. Agric., P.Ag., is a plant breeder with Field Crop Development Centre, Alberta Agriculture and Rural Development, in Lacombe, Alberta. Pat has been a member of the Canadian Society of Agronomy since 1990. She has been a Western Director for the Society from 1994 to 1997, 1999 to 2001, and 2009 to 2011. She was on the CSA Membership Committee from 1992 to 2002. In 2004 she was the CSA Lead on the planning committee for the 2004 Annual Meeting in Edmonton. Pat was an Associate Editor for the Canadian Journal of Plant Science from 2001 to 2006. Pat has been the Secretary of the Prairie Recommending Committee for Oat and Barley since 2007. Pat's research focus since 1997 has been the breeding of two-row feed and malting barley. Prior to that, Pat worked on development of agronomic practices for barley and triticale production especially for annual forage use. Pat continues to work on enhancing water use efficiency, nutrient use efficiency, and quality of feed grains.



Western Director – Dr. Yvonne Lawley

Dr. Yvonne Lawley is a new assistant professor in the Plant Science Department at the University of Manitoba. Her area of research is agronomy and cropping systems. Yvonne received her PhD in soil science from the University of Maryland (2010), an MSc in plant science from the University of Saskatchewan (2004), and a BSc in agronomy from the University of Manitoba (2002). Prior to joining the University of Manitoba, Yvonne was a Research Agronomist at North Dakota State University's Carrington Research Extension Center. To date Yvonne's research has focused on the agronomy of cover crops in contrasting cropping systems.



Eastern Director - Dr. Tarlok Singh Sahota

Dr. Tarlok Singh Sahota, Director of Research and Business, Thunder Bay Agricultural Research Station (TBARS), Thunder Bay, Ontario, has been heading the TBARS since January 2004. Tarlok has generated a lot of valuable agronomic data and has made a difference at the farm level by introducing new crops/cropping systems and beneficial management practices. Originally from a family farm, Tarlok has Master's and Doctorate degrees in Agronomy with distinction, from the famous Punjab Agricultural University Ludhiana, India.



He has undertaken International Course for Development Oriented Research in Agriculture (ICRA), Wageningen, The Netherlands (7 months course meant for young agricultural professionals). Tarlok has 30 years experience in agricultural research, extension and development spread over four continents and 11 organizations.

Highlights of his career include establishment of a 10101 acre commercially viable contract mint farming program for A. M. Todd Company USA and management of large scale commercial farms in Nigeria, including a fresh produce export project. Tarlok served as a member of an International Panel for the Second External Review of ICRA, The Netherlands and has worked in multinational and multidisciplinary teams. He has several other awards and honors to his credit. Tarlok has been an Ontario CCA since 2007, has published 80 extension articles and has made over two dozen research presentations at Canadian Society of Agronomy (CSA) and farmers' conferences in the recent past (total over 200 publications to date). Tarlok is a member of the CSA and the American Society of Agronomy and is a life member of the Indian Society of Agronomy and Indian Society of Soil Science. Since 1993, Tarlok has held senior management positions reporting directly to the board of directors. Tarlok has headed multimillion dollar projects/divisions and has served on the board of directors of a commercial organization, marketing agricultural inputs.

Student Representative - Michel McElroy

Michel McElroy received an M.Sc. in Biology from Dalhousie University, investigating the relationship between plant and soil micro-organism diversity. He has continued on at Dall on a Ph.D. examining the role of genetics in the transfer of nitrogen between forage legumes and grasses. He served as the Plant Canada 2011 Conference Graduate Student Committee co-chair, and is looking forward to getting more involved in the CSA.



CSA Award Winners 2011

DISTINGUISHED AGRONOMIST AWARD

Dr. Lianne Dwyer

Lianne is recently retired from the Research Branch of Agriculture and Agri-food Canada (AAFC). She is currently a real estate agent in Ontario, and a volunteer agriculture consultant co-coordinating an AIC-ITPP (International Twinning Partnership Program) project with Vietnam.

Lianne received her M.Sc. and Ph.D. degrees in Environmental Sciences from Carleton University, and was a Post-doctoral Fellow in Agrometeorology with Agriculture Canada. She has over 30 years experience in agriculture research, including 20 years as a crop physiologist and agronomist in AAFC with research efforts focused on crop environmental interactions. While she has worked on the growth, development and nutrient requirements of several field crops, she has focused on grain and silage corn research. Lianne and her colleagues examined aspects of soil water availability on plant growth, transpiration, photosynthesis, and leaf appearance rates, as well as the influence of air and soil temperature on emergence, growth, and thermal indexes describing phenology and defining the physiological limitations to yield potential and crop quality. Her research impacted crop agrometeorological recommendations in eastern Canada and central and eastern USA.



She collaborated internationally with scientists from Brazil, USA and China. Lianne was an adjunct professor at the University of Guelph and McGill University from 1990-2002 serving as a co-advisor and examiner on many M.Sc. and Ph.D theses. Lianne is also an Honorary Professor at Henan Agricultural University, China.

In 2001, Lianne joined the management team of AAFC Research Branch and was a science director responsible for the Eastern Cereal and Oilseed Research Centre at Ottawa, and for several national research programs (Soil Quality, Biodiversity, and Genomics and Biotechnology). In that capacity she worked on the National Genomics Steering Committee, was manager of the Canadian Crop Genomics Initiative, was AAFC representative at Global Biodiversity meetings and a member of the Steering Committees of the International Plant Genomics Initiative and the International Barcode of Life (iBOL) Advisory Group

Activities which have defined physiological limitations to yield potential and crop quality, crop adaptation to soil and climate conditions, and field management options in eastern Canada are reported in more than 100 refereed scientific publications, 6 book chapters, and more than 175 technical publications and presentations.

Lianne has been active within several Canadian scientific societies (Canadian Society of Agrometeorology and Canadian Society of Agronomy) as well as the Crop Science Society of America (CSSA) and the American Society of Agronomy (ASA) .

FELLOW AWARD

Dr. Bao-Luo Ma

Bao-Luo Ma has been employed by Agriculture and Agri-Food Canada (ECORC) since 1996 as a crop physiologist, with specific interest in crop responses to environment-induced stresses, and nutrient management. Much of his work has been with corn, as well as soybean and other field crops. Since 1991, he has published over 100 scientific papers dealing with crop physiology and agronomy in refereed journals. Bao-Luo is a leading scientist in whole plant physiology and is well known for his pioneer work in nutrient cycling in the soil-plant-atmosphere continuum, development of crop-based indicators that account for spatial and temporal variability, innovative techniques for delivery of substances into hollow-stemmed grain cereal crops, simulation of pollen transfer and the extent of cross fertilization in maize, determination of the potential benefit of genetically modified maize hybrids, and assessment of dry matter accumulation, nitrogen (N) and carbon concentration changes in relation to kernel and whole plant moisture in grain and silage maize hybrids. The products of his research help plant scientists gain new and important insights in crop plant biology, make genetic improvement of important field crops, and assist agronomists, policy makers and producers design and adopt best management practices to eliminate the unnecessary amounts of N application, increase crop yields and production profit, while protect our environment by reducing nitrate leaching to ground water.



He is currently serving the 2nd three year term of the Associate Editor of *Crop Science* and has been recently appointed committee member for the graduate student presentation contest of the American Society of Agronomy.

Dr. Ma is also committed to pass his knowledge to the next generation of young agronomists, through co-supervision of graduate students, hosting foreign students for training periods and training postdoctoral fellows and visiting scientists in his laboratory. He has strong ties with several universities in Canada (McGill and Guelph in particular) as well as in China. In his capacity as Eastern Director (2002-2003), Dr. Ma contributed directly to the Canadian Society of Agronomy and he has also served the society by supporting its flagship journal, both as contributor and reviewer.

FELLOW AWARD

Dr. Art Schaafsma

Dr. Art Schaafsma has taught at the University of Guelph for more than 20 years. He currently heads the Ridgetown Campus of the University of Guelph. Under his leadership, student enrolment in agricultural programs has grown and the campus, largely dedicated to agriculture, has seen several building expansions.

Art truly works for the grower and for the consumer. He is best known for his work with forecasting technologies for control of the fusarium diseases in wheat and corn. Owing to the mycotoxins they produce, these diseases are of great economic significance to Ontario producers, and their effective control is a challenging issue which has cost the industry over \$100 million. After a decade of outputs, his program has reduced the consequences of Fusarium and toxins by over 80% through the development of predictive agronomic models, through an intensive wheat breeding program, through registration of fungicide chemistries in collaboration with the chemical industry, and through application technologies. This research and extension is evident on the world stage, as evidenced by multiple presentations and development of agronomic principles in other countries.



Beyond advancing scientific knowledge in agronomy, Art has significantly contributed to the wider agronomy community, through the teaching of courses such as Insect and Disease Management. He is able to communicate and educate at all levels: post-graduate, graduate, degree, diploma, and certificate. Art's enthusiasm for teaching in the field of agronomy is noteworthy. For example, despite a heavy administrative appointment, Art continues to teach. I believe he is motivated by a love of teaching and a passion to disseminate research solutions to future farmers. Thus, his influence on agriculture is far reaching.

CSA Award Winners 2011 (continued)

FELLOW AWARD

Bill Thomas

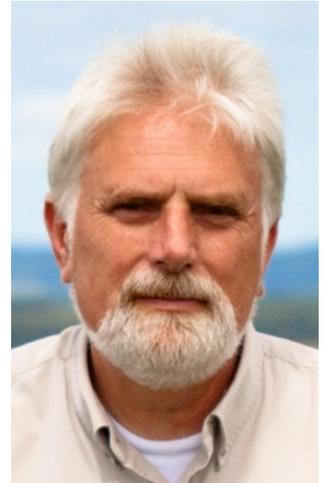
Bill Thomas is a certified crop advisor with over 25 years of experience in agronomy. He worked as the Nova Scotia provincial forage specialist for 16 years before joining the AgraPoint team as a field crop specialist. He has also been a lecturer at the Nova Scotia Agricultural College. Bill began his career in agricultural research with the provincial and federal governments in British Columbia.

Bill is a highly innovative Extension Agronomist who's made substantial and wide-ranging contributions to our knowledge of agronomy and to the Agriculture community of Nova Scotia.

Bill provides top quality advice in all aspects of forage quality, corn, cereals, soybeans and nutrient management; soil fertility and management. He has specialty skills in forage harvest quality-feeding, silage fermentation and all aspects of pasture management.

Bill is a very good educator through field clinics, meeting presentations, lectures, newsletter articles and research reports. His 27 years of great agronomy extension service has meant that both farmers and industry peers have huge respect for his abilities and character.

Bill Thomas is a role model for all agronomists. Through his research efforts and technology transfer activities, he has had great impact on the crop and livestock industry in Canada. Above all his research program provided a training ground for a large number of new and well established Agronomic professionals in Canada and throughout the world.



Financial Statements and Budget

CSA Balance Sheet

as of December 31, 2010 Dec 31, 10

ASSETS	
Current Assets	
Chequing/Savings	
Sunova Credit Union	
Chequing - Organizational CNC	1,821.48
Common Shares SHARE #1	5.00
Joint w/ Chequing SSUP #2	50,508.16
Pest MGMT ChI Fund SSUP #1	13,956.47
Total Sunova Credit Union	<u>66,291.11</u>
Total Chequing/Savings	<u>66,291.11</u>
Total Current Assets	<u>66,291.11</u>
TOTAL ASSETS	<u>66,291.11</u>
LIABILITIES & EQUITY	
Equity	
Net Income	<u>66,291.11</u>
Total Equity	<u>66,291.11</u>
TOTAL LIABILITIES & EQUITY	<u>66,291.11</u>

Financial Statements and Budget

	Last FY	This FY to date	Budget
	Jan - Dec 2010	Jan1 to July 8 2011	Jan1 to Dec31 2011
Ordinary Income/Expense			
Income			
Conference surplus 2010		\$7,624.87	\$7,624.87
Corporate Sponsorship	\$4,147.50	\$1,700.00	\$1,700.00
Member			
Fees,Subscriptions,Conference	\$15,658.73	\$156,340.89	\$156,340.00
Sponsorship for Awards	\$800.00	\$800.00	\$800.00
Total Income	<u>\$20,606.23</u>	<u>\$166,465.76</u>	<u>\$166,464.87</u>
Expense			
Advertising and Promotion	\$251.74		\$0.00
Awards and Grants	\$4,131.60		\$3,500.00
Bank Service Charges	\$6.50		\$10.00
Business Licenses and Permits	\$30.00	\$30.00	\$30.00
Conference flow through		\$130,109.06	\$156,340.00
Copying and Reproduction	\$723.52	\$805.39	\$1,000.00
Insurance	\$729.00		\$729.00
Internet website	\$506.63		\$520.00
Membership Fees (of CSA)	\$1,255.25	\$1,000.00	\$1,000.00
Office Supplies	\$869.77		\$200.00
Payroll Expenses (book keeper)	\$1,046.25	\$1,120.50	\$1,120.50
Postage and Shipping	\$635.82	\$313.01	\$700.00
Professional Fees (audit)	\$175.00		\$175.00
Quarterly Fee Exec Dir	\$7,195.00	\$3,650.00	\$7,300.00
Reimbursable expenses	\$1,454.96	\$52.07	\$100.00
Subscriptions paid to AIC	\$3,570.69	\$3,645.00	\$4,000.00
Webinar at conference		\$674.81	\$674.81
Total Expense	<u>\$22,581.73</u>	<u>\$141,399.84</u>	<u>\$177,399.31</u>
Net Ordinary Income	-\$1,975.50	\$25,065.92	-\$10,934.44
Other Income/Expense			
Other Income			
Interest Income	\$956.92	\$561.44	\$900.00
Other revenue (conference travel grant)	\$0.00	\$7,000.00	\$7,000.00
Total Other Income	<u>\$956.92</u>	<u>\$7,561.44</u>	<u>\$7,900.00</u>
Net Other Income	<u>\$956.92</u>	<u>\$7,561.44</u>	<u>\$7,900.00</u>
Net Income	<u>-\$1,018.58</u>	<u>\$32,627.36</u>	<u>-\$3,034.44</u>

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