The Insider



Topigs Norsvin Canada & USA | Fall 2017



In this issue:

- New Delta II Central Test Station 1
- Breeding for Natural Disease Resistance 2
- Producer Profile: Kingdom Farms Inc. 3
- Swine Reproductive Research Presentation 3
- Producer Profile: McGill Farms 4
- Topigs USA New Veterinarian 5
 Topigs Norsvin Canada New Business Development Representative - 5
- Staff and AI Stations Listing 6
- Topigs Norsvin Insider Quiz 6

Construction site for the new Delta II Central Test Station

Delta II breaks ground in Manitoba

Topigs Norsvin invests in new central test station with CT scan in Canada

Topigs Norsvin is investing CAD \$15 million in a new testing facility in the Canadian province of Manitoba. The new testing facility, Delta II, will test boars of the Z line (dam line) and Tempo (sire line). The new station in Canada has twice the capacity as the original Delta test station in Norway, where Norsvin Landrace and Norsvin Duroc are tested. Just like the station in Norway, Delta II will be equipped with a CT scanner. The facility will become operational in summer 2018.

Delta II will be the central point of a new breeding structure in Canada. Each year, seven existing SPF nucleus farms will deliver young boars, aged 4-6 weeks, to special isolation nurseries. Their health will be checked and they will be genotyped. The top 50% of animals (those with the highest genetic breeding values) will go on to further testing at Delta II, which is located about 30 km away from the nurseries. The new testing facility is equipped with IFIR stations to monitor individual feed intake of all boars during the test. The boars will be CT scanned. Both the test station and the nurseries are constructed in areas with low pig density. Together with high biosecurity protocols on the farms, strict transportation rules, and high levels of health monitoring, the highest health status is ensured, making it possible to export genetics (semen and boars) to almost every country in the world.

"This new test station will substantially increase the genetic progress in our Z line and Tempo. It is part of our strategy to double genetic progress in the next years. Besides improving the accuracy of our testing, it will allow us to improve faster because we can shorten the generation interval," explained Chief Technical Officer, Hans Olijslagers. "It also means that we can deliver the best genetics to our clients sooner, as we can now export the very best boars and semen faster and more easily to their production units."



Breeding pigs for increased Natural Disease Resistance

Background

Disease resistance is the ability of a host to resist infection or exert control over the life cycle of a pathogen. There is evidence of genetic variation in response to disease for nearly every disease in livestock that has been thoroughly studied, supporting the utility of genomic selection to identify and breed livestock for increased natural disease resistance. This is an especially attractive disease control strategy when other (traditional) control methods, such as medication, sanitation, vaccination, or animal management strategies prove ineffective or impractical.

There are several benefits of selecting for increased disease resistance including: decreased impact on performance, decreased pathogen level, and decreased pathogen shedding. However, prior to implementing genetic selection for increased disease resistance, the following questions must be addressed:

- Is the disease of economic importance?
- Is there natural variation in host response to this disease?
- Which genes are associated with resistance to this disease?
- For this gene -- what is the favorable allele for host response to infection?
- What is the effect of the favorable allele under alternate conditions?

An example of how these questions have been applied to investigate natural resistance to porcine reproductive and respiratory syndrome virus (PRRSV)-infection is outlined below:

Question #1: Is the disease is of economic importance?

Yes, historically, PRRS is still considered the most costly disease in swine. Several factors contribute to the economic significance of PRRS, including the fact that PRRS can affect pigs during all stages of production, is difficult to control, and that no effective PRRS control strategy is currently available.

Question #2: Is there is natural variation in host response to this disease? Yes, the first indication of natural variation in host response to PRRSVinfection was the observation that some breeds appear better able to cope with PRRS than others. Such observations motivated the formation of the PRRS Host Genetics Consortium (PHGC) which was formed with the objective of using genomics to identify genes associated with PRRS resistance. To date, the PHGC has conducted over 20 trials in which commercial crossbred pigs were experimentally infected with PRRSV.

Question #3: Which genes are associated with resistance to this disease? Genomic regions associated with PRRS virus load (VL) and weight gain (WG) post-infection were identified by performing a genome-wide association study, which combines genetic information and trait information to identify chromosomal regions statistically associated with the trait of interest. Results showed that a region on chromosome 4 explained 16% and 11% of genetic variation in PRRS VL and WG, respectively. Within this region, a single genetic marker, referred to as WUR, is used to track the genetics of this region.

Question #4: For this gene -- what is the favorable allele for host response to infection?

For WUR, the B allele was associated with lower PRRS VL and higher WG and is, therefore, considered the favorable allele under PRRS challenge. The B allele is also the dominant allele, meaning that pigs with either the BB or AB genotype have increased PRRS resistance.



Question #5: What is the effect of the favorable allele under alternate conditions?

This question was addressed by performing a number of follow-up studies, the first of which was conducted to estimate the effect of WUR following infection with a different isolate of PRRSV and with different commercial crosses. Results of these analyses showed that the B allele maintained its status as the favorable allele for PRRS VL and WG using different breed crosses, but that the effect on WG was not significant following infection with a different PRRSV isolate.

A second study was conducted to estimate the effect of WUR genotype on response to vaccination with a PRRS modified live virus (MLV) vaccine. Results from these analyses showed: 1.) no adverse effect of WUR on average daily gain (ADG) under normal, non-challenged conditions (i.e. when non-vaccinated); and 2.) that the B allele maintained its status as the favorable allele following PRRS MLV vaccination.



An additional experiment was conducted to investigate the effect of WUR following co-infection with another pathogen. Results of these analyses showed no significant effect of WUR on ADG. However, results for VL showed that the B allele maintained its status as the favorable allele following PRRS/porcine circovirus type 2b (PCV2b) co-infection.

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Producer Profile: Kingdom Farms Inc.



Ask any farmer where the passion for their vocation comes from and you are likely to hear that it's "in their blood." For Will Kingma of Kingdom Farms Inc., you might say it's in his DNA. The third-generation hog farmer continues to operate the same farm that was started by his grandfather, Bill Allan, many decades ago, but with his eyes set firmly on the future.

Since taking over the farm in 2004, the Alberta farmer says, "Most years we question the sanity of continuing with hog farming. It has been a very difficult industry, especially in Western Canada." Yet for Will, wife Aggie, daughter Maria, and sons Isaac and Simeon, nothing could be more rewarding than carrying on the family farming tradition as they have done.

Until earlier this year, the Kingmas had been operating two farms, a 2250-sow farrow-to-finish unit, and a separate 400-sow farrow-to-finish operation, as well as their own boar stud. All their hogs were marketed through Western Hog Exchange (WHE) in Alberta. However, Kingma says the economic climate in Western Canada for farrow-to-finish operations such as theirs was not overly conducive to profitability. As a result, the decision was made to get bigger and to take nearly all of his production to the USA for finishing.

While considering the expansion of his home farm to more than 4500 sows producing isoweans, Kingma was compelled to make a genetic change. According to Will, it was an extensive process.

"We narrowed our focus to four genetic companies, then two. We finally came to the decision to move to Topigs Norsvin as our genetic supplier. I felt there were four main components to making the decision: tremendous sow productivity, the carcass value and feed conversion of the Tempo sire, the customer service offered by the company, and the overall value proposition."

As part of the larger plan for expansion, Kingma decided to re-populate his 400-sow unit with Z line grandparent gilts, sourced from the Paradise Valley nucleus in Manitoba, to produce TN70 parent females – the first multiplier of its kind in Alberta. Initially, the 400-sow multiplier located east of Lacombe, will fuel Kingdom Farm's internal expansion. In time, it will provide a supply of TN70s for sale in the Alberta market as well.

Finally, Kingma says he is looking forward to working with Topigs Norsvin to upgrade his sow herd and the market hogs they produce, as well as to improve the profitability of his family's farm in the ever-changing Western Canadian market.

Swine Reproduction Research Presentation

Dr. Louisa Zak, Topigs Norsvin International, recently delivered an invited presentation at the 10th International Conference on Pig Reproduction (ICPR) hosted by the University of Missouri. Dr. Zak's presentation was titled "Genetic control of complex traits with an emphasis on reproduction in pigs."

In her presentation, Louisa described the recent resurgence of interest in swine reproductive research. Because both male and female reproductive rates can limit genetic progress and the dissemination of genetic improvement, the application of new animal breeding techniques has great potential to impact genetic progress at both the nucleus and commercial levels.





Producer Profile: McGill Farms



McGill Farms (Urbana, OH) is a 2400-head (48-pen) gilt grow-out for the Cardinal Pork multiplier that raises gilts for the Kalmbach Feeds production system as well as for Topigs Norsvin USA retail sales. The site is owned and operated by Sam McGill, a 21-year old, fourth generation producer.

McGill Farms received their first gilts in April, a combination of TN70, TN27 and Z-lines. "We are very happy with the quality of the pigs that we receive from Cardinal," comments Sam, "They are robust. Death loss is only 1.5%." Brian Black (Kalmbach Feeds) provides service to the site.

"It's really fun to see our partners succeed with our products," remarks Lance Peterson, Multiplication & Technical Service for Topigs Norsvin USA. "This tunnel-ventilated wean-to-finish facility is running 75%+ selection rate on both GP's and parent gilts and is operated by an outstanding young man with a great attitude."

Sam McGill admires the innovation of Topigs Norsvin, as well as the productivity of their products. This gilt grow-out facility further provides diversification for the McGill Farms operations that includes 3,000 acres of beans and seed corn in Ohio, as well as 3,000 acres of corn and cotton in Mississippi.

At McGill Farms, they believe in hard work, striving for efficiencies, and early adaptation of new technologies. Most importantly, they produce a beautiful gilt for Topigs Norsvin customers and are a welcome addition to Topigs Norsvin USA's family of production partners.

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A final study was conducted to estimate the effect of WUR on economically important traits under non-challenged conditions. It was particularly important to estimate the effect of WUR under this condition since it must be established that implementing selection based on a genetic marker for increased disease resistance will not negatively impact performance under non-challenged conditions. Records collected on Topigs Norsvin N (Landrace), Z (Large White), synthetic (Tempo), and Pietrain (Top Pi) lines were used to address this objective. Results showed no significant effect of WUR on overall economic value for any of these lines.

Conclusions

Results from this case study show how a gene associated with increased natural resistance to PRRS was identified and validated under various

challenged and non-challenged conditions. Taken together, results indicate that: 1.) selection based on WUR genotype can be used to breed pigs for improved natural resistance to PRRSV-infection; 2.) this approach can be used as a potential PRRS control strategy; and 3.) a similar approach can be applied to other diseases, examples of which could include: *Escherichia coli*, porcine epidemic diarrhea virus (PEDV), PCV2b, *Pseudorabies*, or *Sarcocystis miescheriana*, for which evidence of genetic variation in host response to disease challenge was observed for previous studies.

In closing, Topigs Norsvin has invested extensive resources to study natural disease resistance and continues to investigate ways to capitalize on naturally occurring genetic variation for host response to specific diseases such as PRRS and for general, overall robustness to disease challenge.

The Insider

- 4



Topigs Norsvin USA announces new Veterinarian



Dr. Kristine Harms

Key appointment enhances Topigs Norsvin health and biosecurity

Topigs Norsvin USA is pleased to announce that Dr. Kristine Harms has joined its staff as Veterinarian. Dr. Harms will be based out of Topigs Norsvin's Burnsville, MN office. In her new role, Kristine's responsibilities will encompass multiplication veterinary support, health and biosecurity auditing and training, veterinary responsibilities related to the import / export of animals, and other regulatory duties.

Krisitine Harms graduated from Iowa State University's College of Veterinary Medicine in 2016. She also received bachelor degrees from Iowa State University in Animal Science and Agriculture and Life Science Education. Dr. Kristine grew up in the small town of Anamosa, Iowa where she developed an enthusiasm for agriculture and swine production by working on her family's farrow-to-wean farm and via involvement in FFA.

"We look forward to Kristine bringing her training and education to Topigs Norsvin," commented Dr. Mitch Christensen, Director of Veterinary Services for Topigs Norsvin USA. "This addition to our team allows us to maintain focus on the areas of health and biosecurity as Topigs Norsvin continues to grow both in the USA and around the world."

"I look forward to applying my training and skills throughout the Topigs Norsvin production system," added Kristine, "and to being part of this dynamic and innovative swine genetics company."

Topigs Norsvin Canada announces new Business Development Representative



Russ Penner

Topigs Norsvin Canada is pleased to announce that Russ Penner has joined its staff as Manitoba Business Development Representative, based out of the Winnipeg head office. In his new role, Russ will be focused on Business Development in Manitoba.

Russ grew up on hog farm and continued in swine production after finishing high school.

With 20 years working full time in swine production, many of those years were working with Topigs Norsvin genetics. In the past three years Russ was an owner / partner in a 1,500 sow farrow-wean unit and was also the manager of the barn. "His experience in managing staff and working with Topigs Norsvin products will be valuable to existing and future clients" said John Sawatzky, Canadian Sales Manager. Russ also has considerable experience in the swine industry, having served for many years as a district advisor with Manitoba Pork Council.

"I'm extremely excited to take this position with Topigs Norsvin and look forward to all the opportunities with Topigs Norsvin. In my free time I'm an avid sports guy with a love for all sports especially hockey, golfing and baseball," said Russ.

Russ can be reached at (204) 770-1885 or russ.penner@topigsnorsvin.ca



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Rick Beunen Ontario Business Development (519) 317-7403 rick.beunen@topigsnorsvin.ca

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Geraldo Shukuri

Technical Advisor (204) 918-5794 geraldo.shukuri@topigsnorsvin.ca

Russ Penner

Manitoba Business Development (204) 770-1885 russ.penner@topigsnorsvin.ca

Canada **AI Stud Stations**

Magnum Swine Genetics Inc. Fort Macleod, AB Andrew Buesekom (888) 553-4844

Carlo Genetics Inc. Ste. Anne, MB Kyla Ripley (204) 355-4012

Total Swine Genetics Inc. Tillsonburg, ON Stuart De Vries (800) 844-9913

C & M Genetics Lucan, ON Dr. Corneliu Oltean (888) 259-7594

Sunrise Genetics Amherst, NS Mike MacDonald (902) 661-7883

Topigs Norsvin USA

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Curt Hull Multiplication & Sales Support (952) 607-9936 curt.hull@topigsnorsvin.us

Which two Topigs Norsvin lines will be tested at Delta II? _____

How many sows at the Kingdom Farms multiplier?

Where do the McGill Farms gilts come from?

Fax #:____

USA **AI Stud Stations**

Grand Vertex Canton, IL Doug Groth (217) 357-2811

Eastern Iowa AI Spragueville, IA Doug Peterson (563) 689-6661

Mar-Ke Semen Service Sharon, WI Keith & Marie Rithamel (262) 736-2345

Ai Partners-Skylab Morris, MN Bruce Zierke (320) 760-3504

Whole Hog AI Hartington, NE Ron Brodersen (402) 254-2444

opigs	Norsvin	Insider	Quiz

Name:

Address:

Phone #:

How to Play

Please answer the questions in our Insider Quiz. All the answers are in this newsletter. Then fax, mail or email your answers, along with your name, address, and phone number to: Fax: 204-489-3152 Email: info@topigsnorsvin.ca

Entries are to be received by October 31, 2017. The first 10 entries drawn with the correct answers will receive a \$20.00 gift card. The Topigs Norsvin rep in your area will deliver the prize. Employees of Topigs Norsvin and their subsidiaries are not eligible.

Topigs Norsvin INSIDER Quiz Winners

Winners from the last issue will receive a \$20.00 gift card. Here are the winners from

the last issue: Philip Mandel, Roseglen Colony SD; Tom Hofer, Horizon Colony Hogs, MT; Joe Wollman, Long Lake Colony, SD; Rebecca Hofer, James Valley Colony, MB; Jesse Gross, Oaklane Colony, SD; Gilbert Kleinsasser, Huron Colony, MB; Joshua Maendel, Blue Clay Farms, MB; David Hofer, Hillcrest Colony, MT; Aaron Wurtz, Bench Colony, SK; Matt Entz, River Road Colony, AB.

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The Topigs Norsvin rep in your area will deliver your prize. Congratulations!

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Farm Name: _____

Email:

When will the Delta II facility become operational?_____

Winnipeg, MB