

SWINE HEALTH

Title: Implementation of an integrated mapping service to support regional control and elimination of PRRS virus - NPB #11-128

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Date Submitted: November 6, 2012

Industry Summary:

There are approximately 20 regional PRRS projects in the United States in various stages of progress. Each coordinator has their own approach to the challenges of mapping the region, many depending on the assistance of a certain pharmaceutical company. The goal of this project was to develop a mapping service that will be available to coordinators who choose to participate. The database was developed in Oracle and ArcGIS was used to develop the map. Maps are viewed in either ArcReader or ArcGIS online. Participating regional projects include N212MN, Wisconsin and Pennsylvania as well as a national PRRS incidence project involving 10 production systems with a total of approximately 300 sites and one million sows. A common legend has been developed and is being promoted to all participating regions. This system is available for any regional coordinator to use. We believe it serves the needs of the industry and is a valuable resource for the National Pork Board.

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Keywords: PRRS Region GIS Map

Scientific Abstract:

There are approximately 20 regional PRRS projects in the United States in various stages of progress. Each has its own approach to the challenges of mapping the region, many depending on the assistance of a pharmaceutical company. The goal of this project was to develop a mapping service that will be available to coordinators who choose to participate. The database was developed in Oracle and ArcGIS was used to develop the map. Maps are viewed in either ArcReader or ArcGIS online. Participating regional projects include N212MN, Wisconsin and Pennsylvania as well as a national PRRS incidence project involving 10 production systems with a total of approximately 300 sites and one million sows. A common legend has been developed and is being promoted to all participating regions. This system is available for any regional coordinator to use. We believe it serves the needs of the industry and is a valuable resource for the National Pork Board.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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Introduction: There are approximately 20 regional PRRS projects in the United States in various stages of progress. Each has its own approach to the challenges of mapping the region. The first challenge a regional coordinator faces is how to get the maps done. Most coordinators accept the support offered by a pharmaceutical firm and a few make their own. There has been no uniform set of symbols for codifying status of herds, no standard for geographic background, no consistent scale and no consistent understanding on how maps can be shared within and across regions. The goal of this project was to develop a mapping service that will be available to coordinators who choose to participate. In turn, this project will strengthen the capacity of the swine industry to manage regional programs directed at the control and elimination of PRRS virus.

Objectives:

1. Implement a mapping service for any region in United States that is attempting to control / eliminate PRRS and is seeking assistance.
2. Implement a web-based GIS system for real time swine disease surveillance
3. Evaluate performance of the system as a support for regional PRRS control programs in the USA
4. Develop additional features for the system based on user feedback

Materials & Methods:

Objective 1 – Mapping service - We capture GPS location of all known pig sites and use ARC GIS to compose maps. Location and PRRS status of farms is only shown on maps for producers who have signed the participation agreement. For use within the region, maps incorporate a standard template with color denoting the PRRS status of the site if the owner has agreed to participate. Shape of the symbol denotes type of production at the site. Maps with names of owners are used with great discretion and not distributed. Maps are posted at BaseCamp web site with username and password for access. The mapping service has been offered to all PRRS CAP participating coordinators as well as all coordinators who attended the PRRS regional meeting sponsored by NPB and PRRS CAP in June, 2012.

Objective 2 – This system is currently operational and is focused on implementing and evaluating the performance in regional PRRS control initiatives. Key features are:

- The program uses Oracle relational database to store all data. The information is secure and compartmentalized based on the user's credentials. The data connection is web-based and the mapping is conducted through Arc GIS online. The user has access to 9 map views including road and satellite images.
- Password protected access for authorized users based on acceptance of conditions of use and statements of confidentiality. Administrative control limits the access of individual users to a specific project (or projects), for example a PRRS control project in a specific region
- Use of multiple layers of spatial data. Within the same project, both user data (e.g. farm locations recorded by participating veterinarians or companies as well as public data can be displayed on selected backgrounds.
- Users from one project (e.g. Wisconsin) cannot visualize farms in other projects (e.g. Pennsylvania) unless authorized.
- Ability to view (but not edit) all farm data related to a system (e.g., company or practice) limited to authorized organization members.

Objective 3 & 4 – Users are regularly contacted to obtain feedback on the accessibility of the system. Users are invited to provide input on functionality and problems at any time. Suggested changes are communicated and users are advised when updated versions of the system are implemented. This iterative process continued throughout the duration of the project.

Results:

Objective 1 – Arc GIS is the mapping program being used with maps being delivered to projects through the password protected web site called BaseCamp. We post maps of individual counties as pdf files or as an ArcReader database. The latter is preferable because it can be manipulated by the user including turning on/off layers, zooming in or out and exporting static maps as jpegs for presentation in Powerpoint.

Participating regional projects include N212MN, Wisconsin and Pennsylvania. The service will be offered again at the meeting of regional coordinators in December, 2012.

A common legend has been developed and is being promoted to all participating regions. We follow the classification guidelines for sow herds as adopted by AASV.

Legend	
TYPE	
●	Finisher
▲	Sow
■	Nursery
♂	Boar Stud
🏠	Buying Station
✿	Show
🚚	Truck Wash
🏭	Feed Mill
🏠	Slaughterhouse
⊙	Empty
■	Unknown
STATUS	
▲	Negative
▲	Provisional Negative
▲	Stable
▲	Stable Vacc Live
▲	Stable LVI
▲	Positive
▲	Unknown
INVENTORY	
●	Small
●	Medium
●	Large

Obj 2 - ArcGIS online is also available to all participants. The online version is also being used by 10 systems participating in the PRRS incidence project. This project includes approximately 300 sow sites totaling just under 1,000,000 sows and 1,000 affiliated growing pig sites.

Obj 3 & 4 – When all is well, we don't get much feedback. If something needs improving, we incorporate into the program as soon as possible.

Discussion:

The aim of this project is to implement and evaluate a mapping and information management tool that we developed with a long term vision of how the veterinary profession can more effectively harness technological advances. The capacity to provide, at modest cost, a uniform and integrated platform to support independent regional efforts to control PRRS strengthens the ability of the US swine veterinary community to address current and future health challenges.

We have used Oracle to develop the database for storing the data on a secure server and we used ArcGIS to develop and portray the maps. We use either ArcReader or ArcGIS online to view and manipulate the maps.

We are working with three coordinators for regional projects who are using the mapping program in addition to a national PRRS incidence project involving 10 production systems.

This system is available for any regional coordinator to use. We believe it serves the needs of the industry and is a valuable resource for the National Pork Board.