



Piecing Together the Puzzle

Imagine an Alberta landscape that is not only clean, green, and lush, but also glittering with a profitable and flourishing livestock industry. A number of research and development projects are helping to fit the pieces of that landscape together.

Imagine sitting at a table with 1,000 puzzle pieces scattered in front of you. You're eager to get started on creating the scene depicted on the cover of the ... wait a minute! Someone has asked you to put this scene together without a full picture to use as a guide. This is what Darcy Fitzgerald, General Manager of the Alberta Livestock Industry Development Fund (ALIDF), likens some facets of research and development to: moving forward with no real guide or roadmap.

"In this case, the picture is the environmental aspect of livestock production," explains Fitzgerald. "We want to make the picture or roadmap first, and identify the pieces of the puzzle we're missing. Then each group can take their pieces – land, water, or air – and start creating a complete picture." This image becomes a guide that all interested parties can follow along towards the common outlined goals.

The ALIDF, made up of nine livestock industry signatories and a member of the Alberta Agriculture Funding Consortium, looks for projects that address specific livestock industry concerns or provide solutions for overarching issues. When deciding on projects to fund, weight is given to both short and long-term needs as related to the potential impacts of livestock production on the environment.

"Livestock production leaves its fingerprint on the landscape in a number of ways, just like other agriculture or human activities. We want to create a strong knowledge base on topics such as manure management, odour management, and phosphorus loading capacity," Fitzgerald says. In addressing these topics, all Albertans benefit and the direction for the future is made a little clearer.

All About Manure

There exist two schools of thought regarding manure: a) it is a waste to be disposed of, or b) a resource to be exploited. Whichever opinion you hold won't change the fact that manure is created and needs some attention. ALIDF has funded a literature review of manure management research and facts to provide a consolidated knowledge base. "The rationale behind this lit review is to identify what we know and do not know. It highlights

research gaps and is therefore a great tool for researchers and funders alike, to help decide on potential projects or an existing project's direction," says Barb Shackel-Hardman, Leader of the Environmental Practices Unit of Alberta Agriculture, Food and Rural Development (AAFRD).

From the literature review, things like fact sheets or information for news articles can be easily generated. The intention is to have a good snapshot of manure management information from Alberta, across Canada, and beyond. "This consolidation means that dollars won't be spent on duplicated research and that once research is completed, results can



be targeted and applied more quickly," Shackel-Hardman adds.

In a few months time, the review will be completed and available as an impressive, 500-page public document. "There will be an executive summary put together as a synopsis. We don't expect many people will want to read the entire review from cover to cover," she admits. The final version should be viewed as a living document which will hopefully attract continuous input and updating from experts around the world.

Neighbour Relations

Our sense of smell may not be so highly developed as that of a dog, but stand downwind of a large hog production facility on a windy day and it can seem pretty close. The odour piece of the puzzle is being approached from two different angles. Ike Edeogu, with the Agriculture Engineering Branch of AAFRD, is leading research evaluating five different odour abatement techniques.

Edeogu's project is looking at a total of five odour management technologies. His team is working on biofiltration systems: the process of pushing air through a damp, biological media, such as wood mulch or a compost mixture, and allowing

the microbes present to munch on the odour-producing components of the air. The exhausted air comes out smelling more like a carpenter's shop than a hog barn. "Oil sprinkling in the barns and diet manipulation are two other technologies to reduce odour at the production site. We are also evaluating the odour emanating from application of composted manure vs. fresh, and the effect of a composting additive," explains Edeogu.

The immediate and profound benefits of abating odour come with lots of work, Edeogu warns. But anyone who lives downwind is sure to see the value in the successful completion of his research, and the subsequent transfer of new practices to hog producers. He adds that as results are generated in his research there is a strong communications committee ready to quickly relay his research findings to producers.

A second odour related project, headed by Dr. John Feddes, Professor at the University of Alberta, is researching the science of measuring odour and quantifying the components that create livestock odour. The work of both Feddes and Edeogu is closely linked as they search for solutions to the age-old issue surrounding odour nuisance.

Dr. Joyce Van Donkersgoed, Environmental Co-ordinator for Alberta Cattle Feeders Association and Alberta Pork, is part of a large collaboration working towards creating a strategy for evaluating the effects of odour on not only the barn workers' health, but also on the neighbours' health as well. "Last fall, we had a workshop to determine what the questions were that needed answers, and now have ongoing research collecting data for this project," she explains. "We hope to have a Strategic Plan in place this fall to tackle this issue."

Staying Ahead of the Curve

Research shouldn't only react to neighbours' noses, and a good example of some proactive nosing about is a project looking into phosphorus (P) limits in Alberta's soil. Currently, Alberta's nutrient management regulations are based on nitrogen limits for the soil. For now, it's working, but there is growing pressure to address concerns related to soil phosphorus limits as well.

Barry Olson, Soil and Water Research Scientist with AAFRD, along with the

"We want to create a strong knowledge base on topics such as manure management, odour management, and phosphorus loading capacity."

- Darcy Fitzgerald, ALIDF

Alberta Phosphorus Limits Research Team, is moving forward from an initial model to predict phosphorus mobility. The Team has taken the completed work and moved it to what Olson calls "micro watersheds" – eight sites around the province where the prediction model is being tested. These sites differ in either being manured, non-manured, or simply grassland, and measurements are taken regarding P levels in soil and its movement in runoff water. The three-year study hopes to develop better understanding of the interaction of phosphorus in Alberta's agriculture soils, to further protect surface water. Olson says one day this information may be used as the basis for new nutrient management regulations.

Part of the overall initiative on phosphorus will also include work on the economic impact changes to existing farm practices, if needed, could mean to producers. "This economic aspect of the research is often left out of the equation when dealing strictly with the science; however, it is a critical component to the approach Alberta is taking in addressing the phosphorus issue," says Brent Paterson, Head of the Irrigation Branch at AAFRD and Chair of the Phosphorus Limits Study.

Every project on environmental management research the Agriculture Funding Consortium is funding fits together with a larger idea or goal. A crucial, overarching goal is for the industry to operate in an environmentally sustainable manner; managing to the best of their ability the quality of the air, soil, and water. With this picture in mind, the Consortium works with the agriculture industry and research providers in piecing together the puzzle of environmental management. **r&d**