# Argentine Commercial Farm/Ranch Management Information Systems: Design, Capabilities, Costs and Benefits

David Hughes MSc CEO AgManagement Group and TraulenCo, Francisco Abelló MAB, CFO AgManagement Group and TraulenCo, Dr. James McGrann Partner AgManagement Group.

## Abstract:

The integration of financial, tax and production data in a Management Information System can optimize the business productivity. Linking up farms across counties with a central headquarters and having on line up to date information can be obtained with today´s technology.

A Management Information System was set up for farm/ranch business entities whose properties were settled from 150 km to 1,200 km from each headquarters. Its main objective was to have auditable field and accrual and tax accounting records, daily processed business, financial and production information for all the farms and ranches that were administrated. It was also found to be an important tool for developing Standard Operating Procedures and Good Agricultural Practices. More over, now all information is available to decision makers in real time, with instant adjustments for all production and financial data.

Costs and Benefits were analyzed, being the second ones more difficult to measure it was found totally necessary with today's standards to manage and administrate a business.

## Introduction

To manage a profitable business, financial and production performance objectives must be established, that is profit objectives, rate of return on assets and working capital, equity growth, crop and cattle unit cost of production, among others measures.

The integration of production and financial data and information to calculate these business and financial performance are best achieved through accrual accounting practices with linkages between productions, marketing and financial activities.

Production performance objectives must be established measured and will vary according to the activities of the business.

**Design and Capabilities Requirements**

The MIS we needed must consider that we manage four business entities, each having two to six farm/ranches in Buenos Aires province covering 13,700 hectares, and two ranches with 20,000 hectares in La Rioja province. Most farms have different crops and cattle. There are 33 full time employees in the business including administrative staff. These farms/ranches are situated in a 500 kilometer radius around Buenos Aires city, where all the accounting and tax information is prepared, except for two ranches 1,200 km away in La Rioja province.

The main crops are soybean, wheat, corn, and sunflower. All businesses have cow calf herd, and one of them finishes the calves on alfalfa based pastures. All farm machinery operations are contracted. There are different contractors, those that spray chemicals, those that plant the crops and those that harvest the crops. Most crops are produced following no-till practices. The trucking to the grain elevators is provided by third parties. The business works with agronomist consultants, who help with the crop plan, choosing the chemicals to be purchased, and helping farm managers with scouting and use of IPM (Integrated Pest Management), and veterinarian consultants who help with the annual cattle production plan, and are involved in its implementation. Grain is sold lo local business or exporters, depending on best prices at the moment of sales.

The Management Information System we were looking for had to receive, and process production data on a per field, per crop, per activity and per farm basis. That is, we expect to have input (fertilizer, seed and chemicals, ect.) use, machinery labor, dates of field activity, and input inventory automatically up dated on a daily basis. Aside from keeping the financial records updated, we expect the financial information to be tied to the production information. We also expect all inventories to be adjusted automatically as the inputs, and the produce from the farms and ranches are purchased, sold and/or used.

The MIS must also help with tax accounting and tax presentation information for the Internal Revenue Service (IRS). In Argentina, Value Added Tax (VAT), Sales Tax, among other taxes requires forms to be filled out and reported on a monthly basis as well as an annual basis. Thus the MIS output must address our tax

accounting, managerial accounting, and production performance of all businesses at the farm/ranch level as well as for the total business.

The management information system for the company was first set up with the main objective to have auditable information for all the members of the business, quick and organized information for reporting and analysis, and a one stop system to search for business, financial and production information.

To keep all records up dated and allowing for access to a given field record, or profit center information, or activity on a certain farm or ranch, the information had to flow correctly and daily to the headquarters.

These challenges were met through having a clear objective. We wanted updated financial, business and production data on a field and daily basis by farm or ranch. We looked for an MIS that kept good farm records as well as being an accounting software package. We needed good communications, mainly internet access as all information is kept in our central server. This meant we had to upgrade our hardware to take full advantage of the MIS and communications technology.

The main challenge was having the owners and decision makers at the business understand the benefits and willingness to accept the full costs, not only the direct investment in hard and software, but also the hidden costs of training the future users of the system. This plus the employee's full commitment to learn and train helped achieve our goals in implementing the MIS.

In order to implement, use and apply all the benefits of having a management information system, technology was needed at every level of the company. Good internet access, which is still the major challenge, was the most important technology after farm manager training, software, and computers that made this system feasible.

Today all information is loaded remotely through the internet into the headquarters server. This allows managers to get and see all information of the company in actual time and wherever they need to be. Inventories are updated instantaneously, and managers, accountants, investors and any person related to the company can see, analyze and work with the latest current information at the farm and accounting level. A backup of the information is centralized at one location.

Another challenge was to train farm/ranch managers to use computers and keep all records in it. For some of these managers it was the first time in front of a computer. Trained farm managers using computers is still probably the most important issue since it is from them that all information from the farm level starts. Administrative employees at the headquarters had to be trained too. Most of the mistakes are still done at these two levels. Employee's full commitment and openness to be trained was found to the most important attribute that helped the system get implemented. It is important to note that almost every employee was able to commit into this new project.

The chosen MIS is used for accrual accounting, tax accounting and farm record keeping. All production data is linked with the accounting and financial information. Farms are all connected to the internet network in order to send required information. This is a true integrated finance and production MIS.

The software chosen links the data and information within the system. When the invoices of purchases of inputs are received, these are linked to the input receipt document generated by the farm manager at the farm level. The inventories at farm level are then automatically up dated with the new receipts of inputs. These purchases are then linked to the payments and bank accounts. When these inputs are used, the field documents allow for tracing the use of inputs by field, crop and farm, allowing for cost information by field, or crop or farm level. Similarly when produce is sold (grain or cattle), the invoices are linked to outgoing documents filed by farm managers at the farm or grain deposit level. These sales are then linked in the MIS to bank deposits, allowing for income calculations on a by field, crop or farm.

At the same time this information based on accrual accounting practices, allows for keeping good financial records on the business and helps prepare the tax forms to be presented to the IRS.

Field records in the MIS are filled out with information on machinery utilized (planter, sprayer, etc.) and inputs applied to the field with the machinery. That is if we are planting corn, as we detail in the field record the seed utilized, the system automatically adjusts inventory. This inventory has been valued when the purchasing invoice has been matched up with the reception of the seed on the farm. Thus as inputs are used, be it either seed, chemicals, or fertilizer, the inventory on the farm is automatically adjusted, and the costs are applied to the field and the crop.

At harvesting, as the combine changes fields, field records are filled in stating crop, moisture, and yield of the field. This creates a grain inventory which is adjusted automatically as the field records are filled out. As sales are then done, the inventory is adjusted as the grain records are filled out in the MIS.

For cattle records, the MIS allows for keeping track of field use, deaths, births, sales, and purchases of cattle, as well as the weight of the different cattle categories. Thus, cattle, grain and inputs inventory are automatically updated as they are sold, purchased, or used.

With all this information in place and after processing the information, the system is able to give all information needed to be analyzed for managerial purposes i.e. yields of each field or farm, input use per field, crop or farm, costs per activity or cost center, income per activity or cost center, farm field records, purchases, accounts payable, etc.

Understanding that our next challenge in MIS was to obtain field records that allowed proving Good Agriculture Practices (GAP) and traceability of what each farm produced.

This led to generating Standard Operating Procedures at the farm level and at the administrative level, that is the headquarters were accrual accounting and tax accounting is done. It also pushed us to adapt our management records to the Global GAP procedures at the farm and ranch level.

We organized the data in such a way as to have full traceability on all cattle, cows, calf, bulls, steers and heifers. The businesses own cow calf herds, and finish the steers and heifers on alfalfa based pastures. All cattle are identified through an individual ID given by the government, so no duplicates could be used, internally we give all cattle another ID number on a different ear tag, so if the animal lost one of its ear tags, we could still identify him.

All health issues, cattle movements, feed offered to them, and all other related matters have to be registered. If there were special treatments to a specific animal, its number was registered; otherwise the information is registered on a per group basis.

As we have per field records on chemical use, the field records backing the best agricultural practices were already in place.

These SOP´s procedures were set up after analyzing in each place which was the practice, and recording what was done. These procedures are open and known by every employee, manager, investor or stockholder.

**Cost and Benefit of the MIS**

The costs of implementing a Management Information System are usually easier to determine and measure than its benefits. Costs that were able to be measure were of course the software, which usually came along with new hardware, fast internet connections in every farm/ranch, training expenses and standard operating procedures manual. Initial investment was approximately U$S 3.40 per hectare managed in Buenos Aires province, this includes software, hardware, and training. Cost that were not able to measure were the time devoted from employees in understanding the system and effective operation by managers implementing the system and using reports from the MIS. Implementation of the MIS took place over a 2 year period with on going adjustments to meet changing needs or compliance requirements.

Tax and legal reporting requirements require computerized financial accounting systems in Argentina adding the field records, production and unit cost analysis components makes the investment more profitable. This leads to improved management through better control and measuring of performance.

Even if the financial benefits are difficult to measure, the integrated MIS is considered a profitable business investment and highly recommended for large complex commercial farm/ranch businesses in Argentina.

Among the benefits is the access to reliable information, fast, and easy to get for analyzing and reporting, in order to present to owners and investors and meet business tax and legal compliance needs. All information now is auditable by any person related to the business that is today managed using this MIS, giving the managers high standards of openness and confidence of how things are done. The value of having financial information updated instantly in our economic environment is very important. The decisions are taken with better information, allowing for sound economic and financial analysis based on real data. Marketing targets can be settled with greater precision since real per unit costs are known in the required time.

As it was pointed out, the main reason of using MIS was to have accrual accounting, tax accounting, and inventory automatically adjusted, up to date costs and income, allocated by activity, daily information and management reports available for better business analysis and decision making. As a secondary benefit we found we could use the MIS as a basis for complying with Global GAP (Good Agricultural Practices) and for setting S.O.P.´s. With today´s technology we have all information available to decision makers on their computers in real time, with instant adjustments for all production and financial data, allowing for managers to keep making good decisions away from the main headquarters where all the bookkeeping and tax accounting is taking place.

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David Hughes, BS Animal Science, Universidad Católica Argentina, M.Sc. Agricultural Economics, Texas A&M University. Currently CEO and partner of TraulenCo and AgManagement Group, which provides management and administration services for farms, ranches and agribusiness firms, as well as foreign investment consultancy in ag related investments in Argentina and Uruguay.