Final Report

for the

Needs Assessment and Feasibility Study

on

Precision Agriculture Training

for the

Canadian Association of Agri-Retailers

Workforce 2000

and

Assiniboine Community College,

prepared by

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Consultant

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A. Introduction:

This document constitutes the Final Report for a Precision Agriculture Training Needs Assessment, contracted to Ron Johnson by the Canadian Association of Agri-Retailers and their partners in the project, Workforce 2000 and Assiniboine Community College.

According to the original request for proposal, the results of this needs assessment were to address the following areas:

1. Provide an overview of the evolving site specific technology in the agriculture sector and the impact this will have on the production and service sectors;
2. Identify the cost benefits of precision agriculture at the producer and the retail level;
3. Clarify target market(s) for precision agriculture training; and
4. Recommend appropriate delivery model(s).

The proposal suggested the following process be used:

1. Document previous surveys of precision agriculture training needs;
2. Develop and implement an information gathering and validation process to ascertain skills that are needed, presently and in the future, in precision agriculture;
3. Evaluate training currently available and potential strategic alliances; and
4. Identify appropriate training for the various levels of the agribusiness industry to address the "training gaps" as identified in #3 above.

This final report contains the following:

- A description and explanation of the **Data and Information Accumulation Processes** used in obtaining research and survey data.
- An **Overview of Evolving Site-Specific Technologies**
- An **Assessment of the Cost Benefits of Precision Agriculture**
- A **Survey of Existing Education and Training Opportunities in Precision Agriculture**
- **Presentation and Interpretation of Accumulated Training Needs Data**
- **Recommendations**

1. Data and Information Accumulation Processes

Schedule A of the Fee for Service Agreement specified a plan and time line for execution of the project. That plan divides the task into four main parts: **Preparatory Research**, **Data Collection**, **Data Analysis**, and **Generate Report**. A description of how each of these steps were executed follows:

Preparatory Research

- Re-familiarise with current data, issues, industry conditions, corporate relationships, etc.:
  The World Wide Web, email and telephone communications, as well as direct contact with various players in the precision agriculture field, were used to keep abreast of trends and developing events. Attending the Farm Progress Show in Regina proved to be valuable in making contact with a number of industry people. The focus groups were also helpful.
- Build a contact database
  Although a database of about 280 qualified contacts was developed and contacted, that number could have been increased significantly if more time was available for the study. Lists obtained from CAAR and ACC arrived too late to be used in the main survey mailout.
- Research PF applications relative to the market area
  Almost all of the data gathered for this study focuses primarily on western Canada and the northern United States. Even so, much of it will apply to precision agriculture in general.
- Gather cost benefit data and projections regarding PF.
  As much hard data as possible was gathered via the Internet and personal contacts. Although factual and quantitative data concerning cost benefits continue to be difficult to obtain, valid trends can be extrapolated from the existing information.
- Assess the general 'felt needs' of the groups contacted.
  Focus group meetings and personal contacts at the Farm Progress Show and later at meetings in Brandon and Calgary provided significant input concerning the 'felt needs' of people interested or participating in precision agriculture. Felt needs are difficult to quantify but important nonetheless. Felt needs tend to be opinions based on insufficient, and sometimes even incorrect, information but they still affect the actions of the person holding them. For felt needs to become accurate or real needs the person must be informed and knowledgeable, which is the purpose of providing training. This constitutes a "chicken and egg" quandary. If 'felt needs' can be identified now a follow-up study in a few years would provide valuable information on how well training and other information dissemination is improving the understanding of this field.

Data Collection

- Develop a tentative data collection form. Test and refine it using telephone techniques.
  The data collection, or survey form, was developed and refined as per the schedule. A sample of the form is included at the end of this report. The goals of the survey form were as follows:
  - identify the person completing the form (respondent), including address, phone/fax number and their title or responsibilities within their organisation.
  - determine the type of organisation they represented
  - determine how many people in their organisation have been or will be affected by the growth of precision agriculture, as well as its impact in terms of jobs.
  - identify the job categories of these people, how many in each category and what training the respondent believed would be needed.
  - determine the opinions of the respondent with regards to possible new technical qualifications in the area of precision agriculture
  - determine the respondents' commitment to various types of support for training
  - provide opportunity for the respondent to express additional comments regarding types of training which should be available
  - determine the respondents' opinions regarding various delivery methods, including who should deliver the training, where should that training be delivered and any other comments which the respondent would like to express on delivery methods.

  Before sending out the survey en mass, various industry representatives and educational personnel were consulted about its content, style and other characteristics. The form development was completed within a couple of days of the projected completion date of June 13, 1997.

- Conduct at least one focus group meeting at the Farm Progress Show (June 18, 19, 20, 21)
  Two focus groups were conducted on Friday, June 20 at the Farm Progress Show in Regina, Saskatchewan. A third focus group was conducted at Assiniboine Community College in Brandon, Manitoba on Thursday, July 10. A fourth, and final, focus group was conducted on July 18 at the Blackfoot Inn in Calgary, Alberta. This meeting was conducted on a less formal basis with only three people in attendance. These three people, however, play significant roles in the precision ag field. The focus groups included representatives from a variety of precision ag-related stakeholder groups. These included: producers, machinery dealers, machinery manufacturers' representatives, GPS manufacturers, precision ag hardware/software dealers and manufacturers, a precision ag magazine editor, community college instructors, university and extension professors, general farm supply dealers, fertilizer dealers and applicators, crop consultants and ag associations. A list of participants is included in Appendix C at the end of this report.

The purpose of the focus groups was to gain more direct information than could be obtained through the survey. The participants were encouraged to generate ideas and to try to identify the important issues surrounding precision ag training needs. It should be noted here that conducting the focus groups before developing the survey might have resulted in some changes and improvements to the survey. Unfortunately, time constraints associated with completing the study made it necessary to conduct the focus groups concurrently with the survey.

The focus groups were conducted as follows:

- Introductory comments by the discussion leader to explain the purposes of the needs assessment and the focus groups and to outline the agenda for the meeting. The participants were asked to prepare introductory statements relating to the following questions: who requires training, what kind and how much, how should it be delivered, and what are the key issues surrounding training.
- Brief statements by each participant including an introduction, who they represented and their perspective on precision ag training needs as per the preceding point.
- General discussion, directed and moderated by the discussion leader. Key issues were identified.
- Completion of the survey and further discussion regarding some of the survey questions.
- Summation by the discussion leader. The key issues were more clearly defined and recorded.

  The discussion was documented by a recording secretary. The discussion leader also recorded key points on flip charts for later documentation.

- Fax or email form to contacts. Follow up by phone.
  By June 28 approximately 200 surveys had been mailed. Approximately 50 surveys had been distributed at the Farm Progress Show and about 30 had been distributed at the first three focus groups. Each survey was accompanied by a self-addressed, stamped envelope to facilitate the return of the form. In addition, an introductory letter accompanied each form with an offer to send a Precision Ag Info Pack to everyone who completed and returned the form. Several precision ag magazines have provided complementary copies of back issues of their magazines. Other companies have been contacted for similar donations.
- Due date for return of data collection forms: July 7, 1997
  Although a due date of July 7 was indicated for return of the survey forms, they continued arrive well into August. The final count of received surveys was 61 of which two were rejected because they were not completed. The response rate was about 21% of the total.
- Format and write a preliminary report sketching what has been done.
  The interim report was written and submitted by July 15, 1997.

Data Analysis

- Assemble and organise data

  Data acquired at focus groups was recorded and later transcribed for presentation as part of this report. A database, including entry and report forms, was designed and created for the survey data. Data was then manipulated in various ways in order to show significant relationships and trends.

- Do a preliminary assessment of the data. Take any required steps to add missed data, correct obvious errors, follow up stragglers, re-evaluate the significance of extreme data

  - During preliminary assessment of the data it became obvious that a few respondents misunderstood how parts of the form were to be completed. Although this was not a widespread or major problem, in a few cases some adjustments had to be made to the way information was presented.
  - A few surveys were distributed and received late in the process from people with significant roles in the field.
  - In a couple of instances, more than one survey respondent represented the same organization (especially government agencies). In these cases data had to be adjusted so as not to use the same numbers twice.
  - Some of the same respondents represented organisations which had potentially hundreds of people in need of precision ag training. Interpretation of the data required taking this into account.

- Completion date: July 25, 1997

  Preliminary assessment of the data was completed about two weeks behind the scheduled completion date.

- Do a more in-depth assessment and analysis of the data to identify trends, important points, compare with early data

  In-depth assessment involved more closely examining the data and manipulating it in various ways using database reports and spreadsheets. This resulted in several interesting trends and clearly defined points which will be discussed later in this report.

- Consult with other 'experts' to add insight to the analysis

  This consultation process has been ongoing and included discussions with various participants in the precision ag field directly and via telephone and email.

- Formulate conclusions

  Interpretation of the data, conclusions, and recommendations can be found later in this report.

- Complete analysis

  This report constitutes the completion of the analysis phase of the study.

- Completion date: August 15, 1997

Generate Report

- Write the final report

  This report fulfills this requirement.

- Submit final report

  Completion of this report was about two weeks later than projected because of delays earlier in the process and the unexpected length of time required for analysis, writing and producing the report.

- Projected Completion date: Sept 1, 1997

  Actual completion and submission date was Sept 15, 1997

- Follow up with ACC and other stakeholders to explain, present, interpret the report

- Completion date: Sept 30, 1997