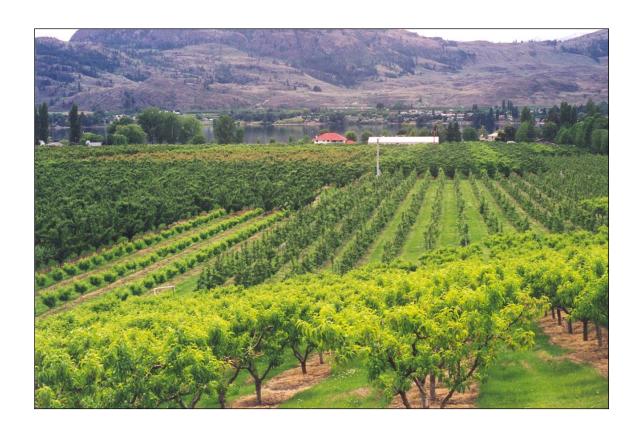
AgFocus
A Surveyor's Guide to Conducting a Land Use Inventory



November 2014 Edition



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For more information or to receive an additional copy of the **AgFocus: Surveyor's Guide to Conducting a Land Use Inventory**, please contact the Strengthening Farming unit at:

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Prairie Farm Rehabilitation Administration

References:

Land Use Decision Support Unit, 2007 Ag Capture: An Agricultural Land Use Inventory Tool, Canadian Prairies Edition Agriculture and Agri-Food Canada

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INTRODUCTION

AgFocus is an Agricultural Land Use Inventory (ALUI) System developed by BC Ministry of Agriculture and Lands (MAL), Sustainable Agriculture Management Branch (SAMB), Strengthening Farming Program. AgFocus provides the tools to efficiently capture detailed information about land cover and land use on agricultural lands.

The Surveyor's Guide is a companion document to AgFocus - An Overview of Agricultural Land Use Inventory, and AgFocus - A GIS Analyst's Guide to Agricultural Land Use Inventory Data.

All three documents were revised significantly in 2009. In 2005, together these three documents replaced the original AgFocus - A Guide to Agricultural Land Use Inventory.

The Surveyor's Guide is a reference when performing an AgFocus Windshield survey, either in the capacity of an agrologist or a data entry person. The guide includes a description of the field survey method and tips on conducting a safe and accurate survey. It describes the data model so that surveyors are aware of the type of information that needs to be collected.

The Surveyor's Guide can be used in conjunction with the AgFocus Field Guide which lists all the required codes.

CONDUCTING AN AGFOCUS SURVEY

Survey Method

AgFocus employs a "windshield" survey method designed to capture a snapshot in time of land cover and land use on legal parcels. The survey is typically performed by a team of two people. It mainly captures data visible from publicly accessible lands and roads. Where visibility is limited, data may be interpreted from aerial photographs and local knowledge.

Identifying the survey area

The survey may encompass a subset of the farming community where a specific need for information exists. If a broad information base is needed, the survey may cover all land in the municipality's ALR. It is a good idea to include land along the urban side of the ALR boundary when surveying the entire ALR area. This information will be particularly important if more focused "edge" planning to promote land use compatibility is anticipated. Potential farming areas outside of a municipality's ALR lands should also be considered for surveying.

Parcels are selected for survey if they are wholly or partially within the identified survey area or if they are classified as a Farm by BC Assessment.

Survey Team & Expertise

The survey can usually be conducted by a team of two. It is critical that at least one of the surveyors have a strong understanding of the agricultural activities and crops which are common in the study area. This surveyor serves as the "agricultural eyes" of the survey team. It is recommended that this person be present throughout the

entire survey to ensure consistency in how the data is recorded. The other team member should be computer literate and familiar with the data model and data entry tool. Other essential skills include interpreting maps and aerial photography.

The surveyor with the most agricultural expertise is responsible for driving and identifying land cover and land use. The second person records the information into a database on a laptop computer. A data entry tool built in MS Access has been designed for this purpose. On difficult roads or in heavy traffic conditions it is often necessary to add a third surveyor to focus solely on driving.

Together, the survey team examines each legal parcel in the study area and records both the land covers and the land use activities. The database is later linked to a GIS layer of legal parcels in the survey area. A GIS analyst can then query, analyze, and map the inventory information.

It is advantageous to have one surveyor from the local government's planning, GIS, or mapping department staff when an ALUI is undertaken by a municipality or regional district. This ensures a local staff person is aware of how the survey was conducted and is able to respond to questions concerning data collection and interpretation. This person can also provide valuable local knowledge of an area's history and current land use.

Time

On average, surveying can be done at a rate of about 1000 hectares per day. Surveying may be slower than this in an area with small parcels and complex land uses. The rate of surveying will also vary depending on traffic, weather, the experience of the surveyors, the size of the survey team, and the level of detail being recorded.

Safety Considerations

Conducting a windshield survey requires driving at low speeds and stopping often, while maintaining a high level of focus on the landscape being surveyed. The following safety considerations will help in dealing with traffic:

- Survey should be performed by a minimum of two people. One person drives while the other navigates and records information.
- Use a clearly marked government vehicle.
- Turn on hazard lights to alert other drivers when driving slowly and stopping frequently.
- Be aware of congested or high speed roads with narrow shoulders. Plan to avoid these routes during rush hours.

Survey preparation

The following is a list of the elements needed to conduct a survey:

- Vehicle
- Survey maps
- Street map for navigation

- Laptop computer with data entry tool
- Adapter for powering laptop from the vehicle
- Memory stick for backing up data
- AgFocus Field Guide
- Moving map software and GPS receiver to aid in parcel identification
- Binoculars (optional)
- Camera (optional)

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Maps are used to identify properties and features when conducting the survey. Maps should be at a scale of 1:2500, 1:5000, or 1:10 000, and include:

- The legal parcel boundaries (cadastre)
- Unique identifier for each legal parcel (Parcel ID)
- The preliminary land cover polygon boundaries (digitized prior to field survey using aerial photography)
- Unique identifier for each preliminary land cover polygon (Cover ID)
- The boundary of the Agricultural Land Reserve (ALR)
- Base features such as streets, street names, watercourses and contours
- Aerial photography

Aerial photography provides a valuable source of information. It helps orient the surveyor and provides visual references to assist with locating the mapped parcel on the ground. The photography also helps to identify crops and structures which are not easily seen from the road.

Tips on Surveying

Consistency in survey technique is essential to minimize errors. It is recommended that land covers be recorded first and land uses be recorded second.

The presence of livestock can sometimes be identified by other clues when it is not visible from the road. Examples of clues include a recently grazed pasture, the type of fencing or barns, or the presence of a horse trailer in the driveway.

Look for signs on the road or at the farm entrance for clues about the property. Signs may indicate the farm name or the types of commodities produced, e.g. "Farm Fresh Eggs" or "U-Pick Raspberries"

Use the aerial photography to identify structures that can't be seen from the road.

Be prepared for questions from residents. It is a good idea to have an information plan to inform people of what you are doing; carry business cards to give out, put an article about the survey in the local paper, and have contact names for people to call.

DATA MODEL

Ministry of Agriculture and Lands (MAL) has developed a data model based on past experience with inventories. A compatible MS Access database with a data entry form is used to enter and store the information collected. Customization of the database may be required prior to starting a survey to incorporate the local area's parcel information. The database contains three main data tables:

- Parcel
- Use survey

Cover survey

Parcel Table

The Parcel table contains existing information about the parcels. This table is initially derived from the polygon attribute table of a municipality's GIS cadastral layer. It typically includes the street address, property type, crown administration, parcel area, ALR inclusion, and zoning. Data from BC Assessment and other inventories is integrated to give the surveyor as much information as possible about the parcel.

Use Survey Table

This table stores the survey data for land use on a parcel. Several different use types are stored for each property in the categories of agricultural use, residential use, and other use.

Cover Survey Table

This table stores the survey data for land covers on a parcel. The table may contain more than one record for each parcel as it is common for more than one land cover to exist on one parcel. Information recorded for each cover polygon includes physical cover type, irrigation, and agricultural usage limitations (ex topography).

DATA COLLECTION

Data Entry Tool Overview

The data entry tool is designed to work in conjunction with maps that identify parcel boundaries, land cover polygon boundaries and associated identifiers.

Parcels selected for survey are drawn with a thick yellow border, have a bold yellow Parcel ID label, and have one or more blue land cover polygons. Each land cover polygon has a blue Cover ID label.

Figure 1: Survey Map

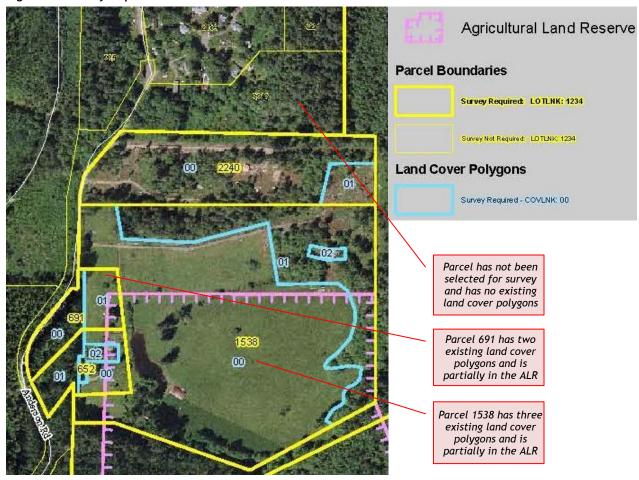
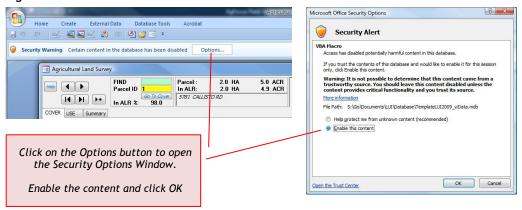


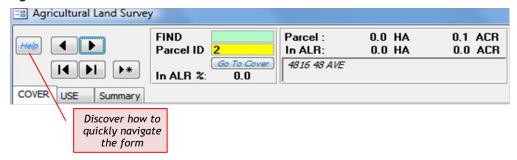
Figure 2. Enable the database content



Launch MS Access (2007 or 2010) and open the database developed for your project. If a security warning appears underneath the top ribbon, you must "Enable the content" so the built in macros will run.

The form may not respond, may break, or may return error messages if the content is not enabled. If an error message occurs in the database, press 'Esc' to close it. After enabling the content, the database will close and then reopen.

Figure 3. Form Header



The form header contains basic parcel information such as parcel area, parcel area in the ALR, and parcel address if known. The header also contains arrows to navigate between parcels and a help button.

The help button displays a list of shortcut keys for navigating the form. Using the shortcut keys will significantly increase data entry speed. It is worthwhile for the data entry person to become familiar with the shortcut keys.

Figure 4. Shortcut keys

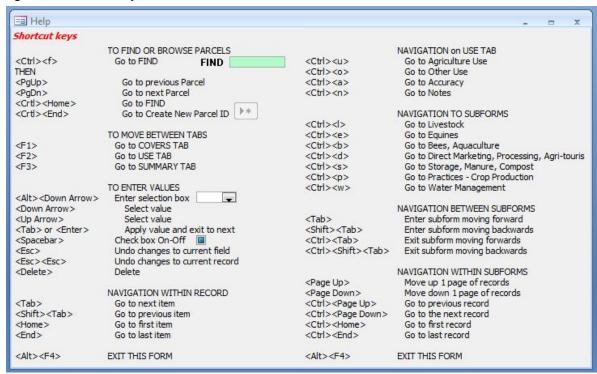
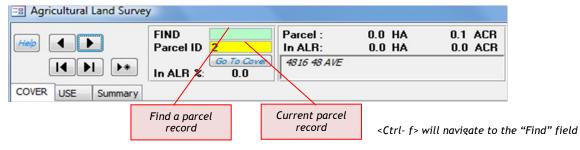


Figure 5. Form Header



Enter a Parcel ID number referenced from one of the field maps into the green "Find" field and press Enter. The form will move to the existing record for that parcel. The yellow Parcel ID field is a reference only field and numbers cannot be entered into it.

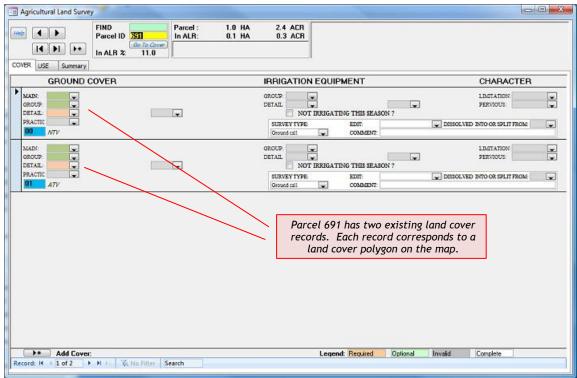
The form has four tabs that will be explained in greater detail. Use the shortcuts below to navigate to the "COVER", "USE", "Summary", and "Error List" tabs.

F1> to navigate to the "Summary" tab

<F1> to navigate to the "COVERS" tab
<F2> to navigate to the "USE" tab
<F4> to navigate to the "Error List" tab

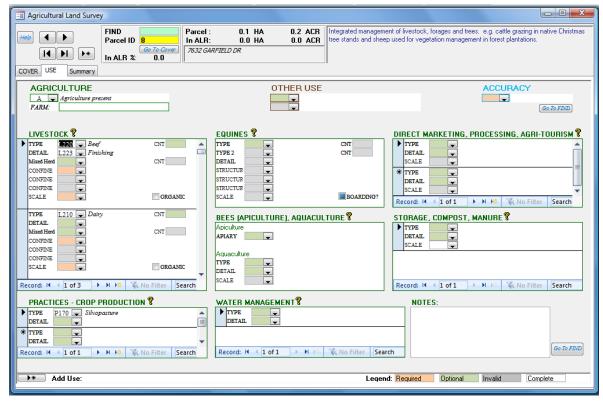
Each parcel requires data to be entered in COVER and USE tabs. The Summary tab provides additional parcel information to aid the survey crew in making decisions while the Error list tab ensures all records have been surveyed correctly.

Figure 6. COVER Tab



Note: If this parcel had NOT been selected for survey, the COVERS tab would be blank.

Figure 7. USE Tab



Note: If this parcel had NOT been selected for survey, the USE tab would be blank.

Figure 8. Summary Tab

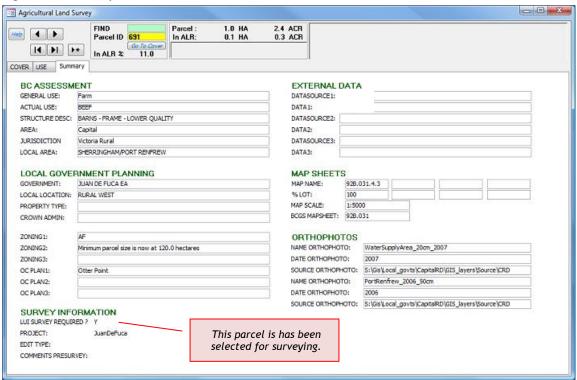
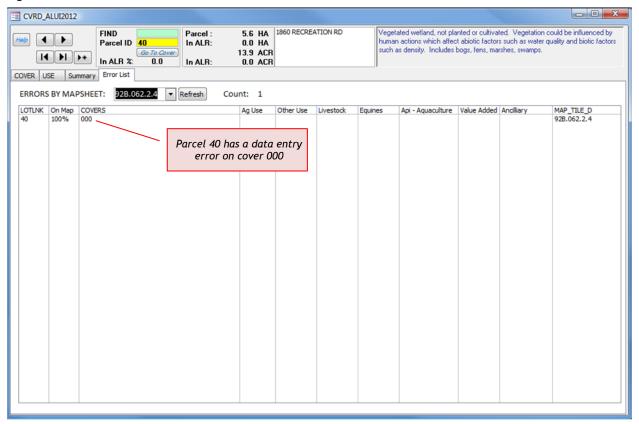


Figure 9. Error List Tab



Land Cover Survey

The primary purpose of a land cover survey is to separate the parcel into homogeneous components or land cover polygons and assign each a description based on predefined classifications. Prior to the field survey, land cover polygons are delineated in the office using orthophotography and assigned a preliminary classification. Further delineation may occur during the field survey until one of the following is achieved:

- Minimum polygon size (500 sq M (~5400 sq ft)) or minimum polygon width (10 M (~33 ft)) is reached \cdot
- Polygon is homogeneous in physical cover and homogeneous in irrigation method.
- Maximum level of detail required is reached

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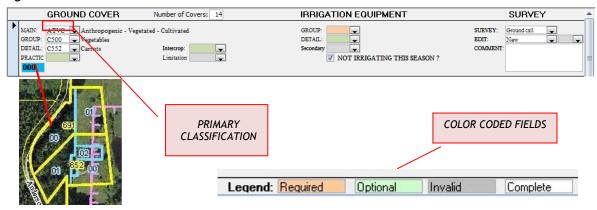
NOTE: Each land cover polygon must correspond to a land cover record. If a land cover polygon is delineated in the field, a corresponding record must also be added to the database.

The primary level of stratification is based on (bio) physical land cover. It distinguishes between anthropogenic and natural / semi-natural lands. Further distinctions are made between terrestrial, aquatic, vegetated, and non-vegetated lands. See Appendix A for the full classification.

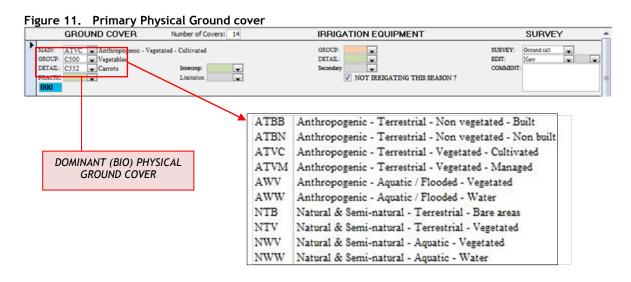
Once stratified, each polygon may also be assigned additional attributes such as crop specific practice or agricultural limitation.

The secondary level of stratification is based on irrigation method.

Figure 10. Land Cover Record

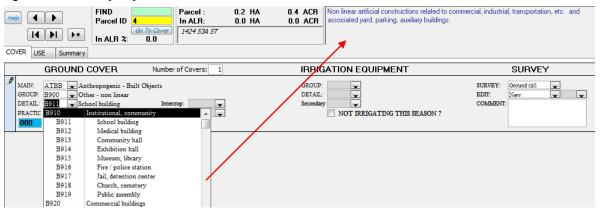


Each land cover record has an identifying number starting at "000". Combined with the Parcel ID, the Cover ID provides the link between the map and the database. Data entry fields are color coded to indicate if additional information is required for the current record. As data is entered, the color shading will update automatically.



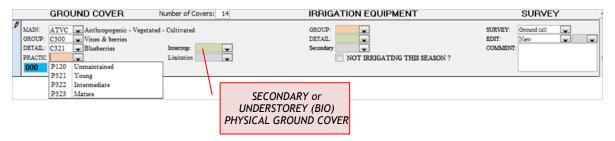
Select the primary physical ground cover using the Main, Group and Detail fields. Making selections in the Main and Group fields will filter the options available in the Detail field. A selection may also be typed directly into the Detail field.

Figure 12. Primary Physical Ground cover



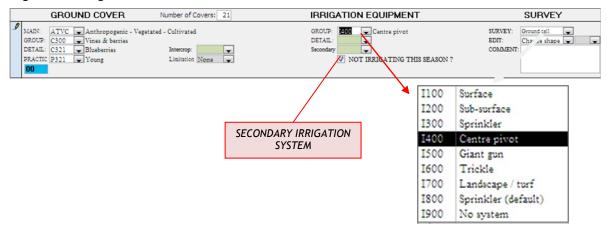
Further description of the currently selected code is presented in the top right corner of the form. Browse through all the options and choose the one which most accurately describes the dominate features of the land cover polygon.

Figure 13. Secondary Physical Ground Cover and Crop Specific Descriptor



If the main ground cover is ATVC, a secondary ground cover is optional. For some specific crops, a crop specific descriptor is required. The color codes will indicate this.

Figure 14. Irrigation



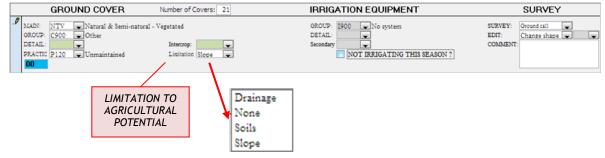
If ground cover is "Cultivated or Managed Vegetation", select the type of irrigation system present. If no system is present, use 1900: No system. A secondary irrigation system is optional once the primary system has been selected.

If the irrigation system is disabled or has not been in use during the current season, check "NOT IRRIGATING THIS SEASON".

Note: 1900 with "NOT IRRIGATING THIS SEASON" is an INVALID selection as a nonexistent irrigation system cannot be disabled or not in use.

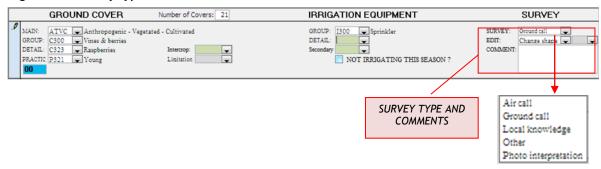
If an irrigation system is clearly being used, but is not visible, use 1800: Sprinkler (default).

Figure 15. Limitation to Agricultural Potential



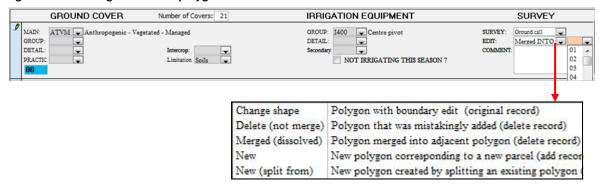
If the ground cover is Natural & Semi-Natural Terrestrial Vegetated (NTV) or Anthropogenic Terrestrial Non-vegetated Built (ATNB), the limitation field is required. The main factor that limits agricultural potential is listed here.

Figure 16. Survey type and Comments



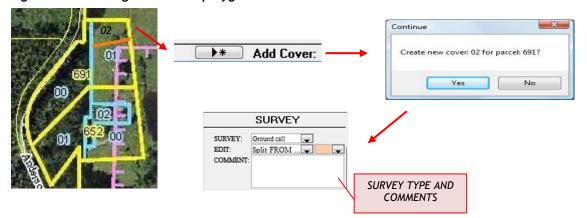
If the land cover polygon is not viewable from the ground, it can be surveyed from the air, by using photo interpretation or by using local knowledge. Record the method used.

Figure 17. Editing land cover polygon in the field



Preliminary land cover polygons and associated classification are based entirely on ortho photography which is often not current or does not provide a clear understanding of the patterns of ground cover. Edits are often required. Land cover polygons can be "merged into", or "split from" adjacent land cover polygons.

Figure 18. Editing land cover polygon in the field

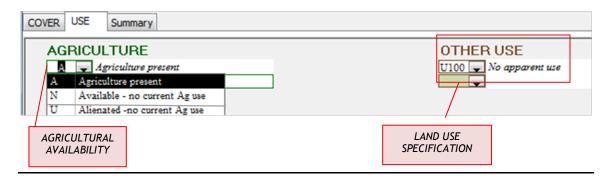


A new land cover polygon may be added by clicking on the "Add Cover" tab at the bottom of the page. The land cover polygon number, survey type, and comments can then be added. New polygons must be hand drawn on the appropriate orthophoto.

Land Use Survey

The primary purpose of the land use survey is to determine and record the presence of agricultural and agricultural related activities on the land parcel. The information recorded in the land use survey is important for understanding how the parcel is utilized.

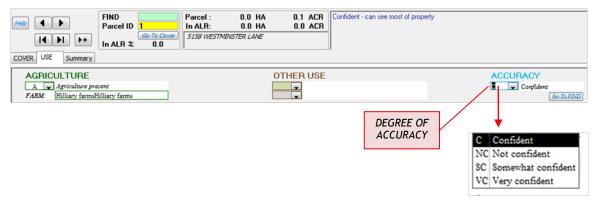
Figure 19. Agricultural Availability



Determine if agriculture is presently in use, available but not currently in use, or unavailable. Two non-agricultural land use categories can be selected.

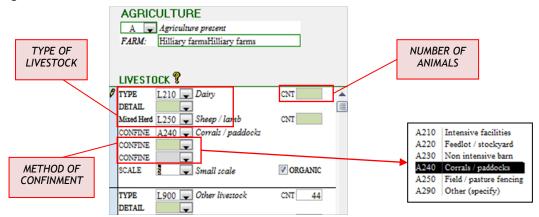
NOTE: If there is no current use of agriculture, the rest of the form does not need to be filled in.

Figure 20. Parcel Accuracy



The level of accuracy is based on the degree of the property that can seen. Refer to the description box in the top right corner for more information.

Figure 21. Livestock



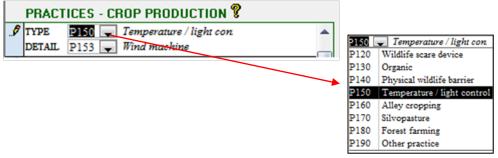
The type of livestock is selected from the dropdown box. Further classification may be selected from the detail field.

If more than one type of animal is present and occupying the same area, select the mixed herd field.

If more than one type of animal is present and they occupy separate areas or have separate shelters list each livestock type in a separate field.

Up to three methods of animal confinement may be selected. The scale of the livestock opertaion is required. The number of animals is an optional field.

Figure 22. Crop Production Practices



Important information about crop production and preservation practices can be entered here. The detail field contains additional options for each selection.

Additional subforms exist for water management, equines, apiculture (bees) and aquaculture, storage, compost and manure, direct marketing, processing and agritourism.