

Legume Pest & Disease Database vers 2

Introduction

The Access database developed in December 2012 has been updated in line with the following changes recently made to the data capture tools:

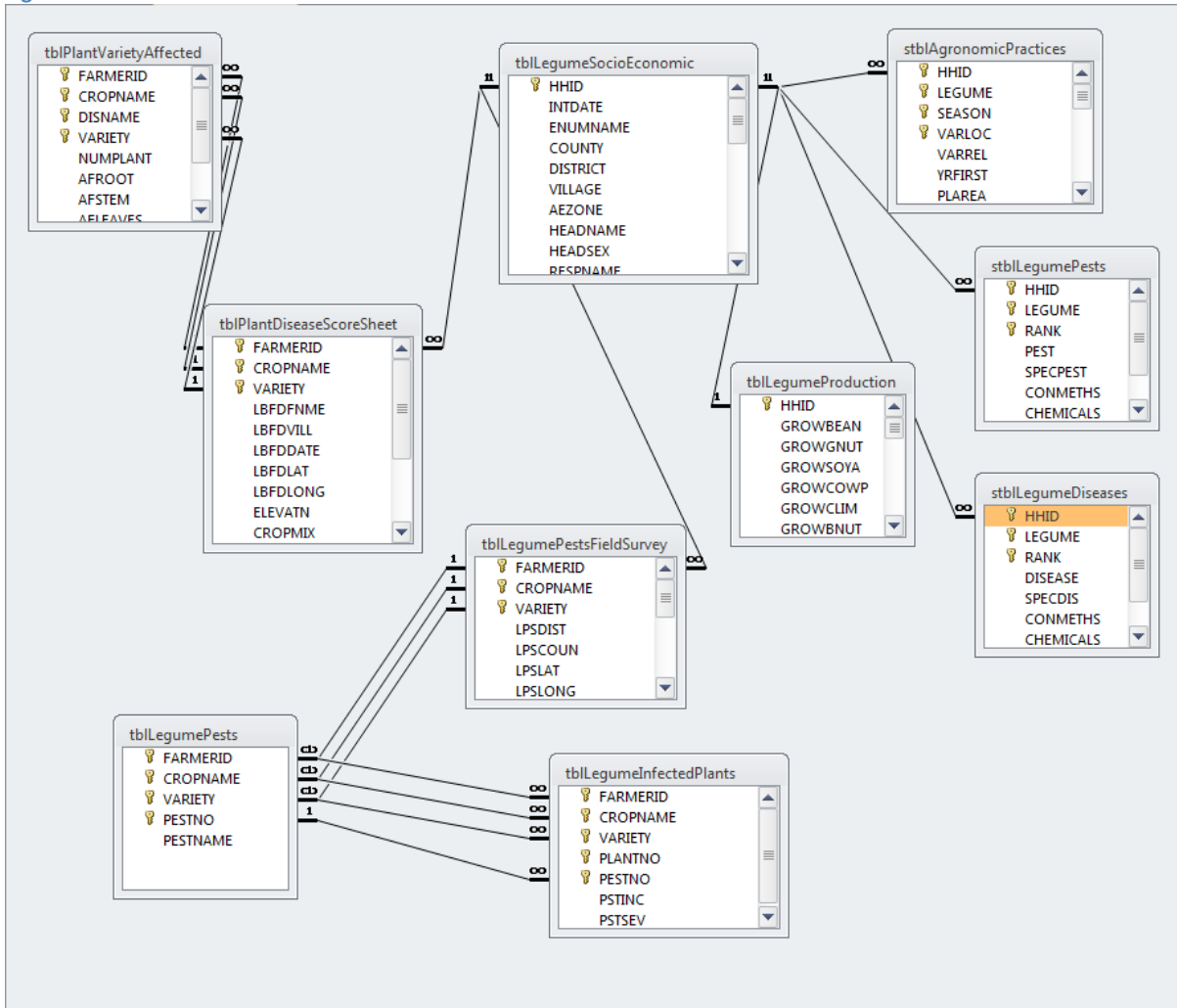
- **Legume disease survey** and **Situational analysis survey** questionnaires were merged to form the **Legume Socio-economic questionnaire**;
- In the **Disease field survey** questionnaire three questions were added
 - i. Crop mixture
 - ii. Fertility amendment
 - iii. Age of crop
- In the **Pest field survey**, the following fields were added:
 - i. Country
 - ii. Age of crop
- and the following fields were removed
 - i. Division
 - ii. Field number
 - iii. Mobile number

It is assumed that the **Legume Socio-economic questionnaire** is completed for each farmer and that the Household ID (HHID) from this questionnaire is the same as the Farmer ID (FARMERID) in both the Pests and the Diseases Field Surveys.

Database Structure

The structure of the database is shown in Figure 1. This shows the tables, relationships and the primary key fields (unique identifiers). The relationships have been set in such a way that you must enter the Legume Socio-economic Questionnaire data for a farmer first before entering either the Pests or the Diseases Field Survey data. This assumption enables us to enforce the relationships and to have the farmer ID on a drop-down list on the data entry forms for these two survey questionnaires.

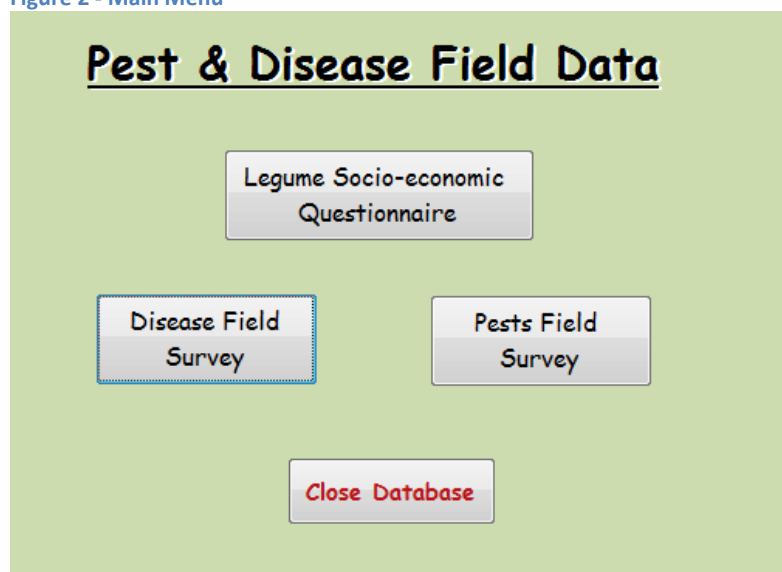
Figure 1 - Database structure



Main Menu

The database opens with a menu screen with command buttons to open each of the data entry forms. As mentioned above the order of data entry is important – for a particular farmer you must enter the Legume Socio-economic questionnaire first.

Figure 2 - Main Menu



Legume Socio-economic Questionnaire

Figure 3 shows the first part of this form. You must enter the Farmer ID which must be unique. You should allocate a unique code to all farmers and write this code clearly on the top of each sheet related to that farmer. Enter this code at this point.

The date should be entered as dd/mm/yyyy and will display in the format 18-Dec-12. It can also be selected from the calendar icon that appears when you move into that field on the screen.

The name of the farmer is a text field and allows up to 50 characters. County, district, village and agro-ecological zone are also all text fields and they allow up to 30 characters each. The sex of the household head is either Male or Female and can be typed in or selected from the drop-down list. For the sex of the respondent tick the appropriate radio button.

For the number of years of legume production enter the nearest whole number of years. For acreage under legumes select the appropriate radio button.

The database allows for 3 varieties to be specified and each can be up to 30 characters in length.

Source of seed is a multiple response question so you can select one or more of the given options. In general where the screen displays a radio button (e.g. the acreage question) only one choice is possible; where there are checkboxes, multiple choices can be made.

Other crops grown on the farm is an open-ended question and we have allowed up to 100 characters. For each part of question 5, up to 50 characters are allowed. Question 6 is multiple response so you can select both options if appropriate.

Figure 3 – Socio-economic survey screen 1

Socio-economic profiling and analysis of the legume crop management system

Household ID:

1. Date of interview (DD/MM/YYYY): _____ 2. Name of enumerator: _____

3. County: _____ 4. District: _____ 5. Village: _____

6. Agro-ecological zone: _____

7. Name of head of household: _____

8. Sex of head of household: Male Female

9. Name respondent (if not household head): _____

10. Sex of respondent (if not household head): Male Female

11. Age of the household head (years): _____

12. Education level of household head (tick): Primary Secondary University Other
 Specify other education: _____

13. Total number of household members: _____ (Male): _____ (Female): _____

14. Number of household members working on farm on full-time basis: _____

15. Land ownership and access: Acres owned: _____ Acres hired: _____ Acres Communal: _____ Others: _____
 Specify other type of land ownership: _____

16. Latitude (+/- dd.dddddd): _____ Longitude (ddd.dddddd): _____
 Elevation (mm): _____

17. Names of five most important crops grown in past 2 years:
 1. 2. 3. 4. 5.

18. Participation in legume promotion activities/projects: 1. Participating: 2. Non-participating:

2. Legume Production

Record: 1 of 1 | No Filter | Search

You should always start at the **Household ID** which is compulsory, then will move through questions 1 to 12 in numeric order. In question 12 if you choose “Other” as the option you will move into the space to “Specify other education”, otherwise you will move directly to question 13.

For question 13 you should enter the total number of household members, then the number of males and the number of females. There are checks in the database for these numbers so if you enter the number of males or the number of females as being greater than the total number of household members you will get an error message and taken back to re-enter the number of household members. As you move onto the next screen there is a further check to make sure that the total number equals the number of males plus the number of females.

Question 14 also includes a check to make sure the value entered is not greater than the number of household members.

For the land ownership question take care when entering the decimal places. This is where mistakes can easily occur. If you enter zero for “Others” then you will skip the space to specify the other type of land ownership.

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Latitude should be entered as decimal degrees either north or south – i.e. the first character should be either “S” or “N” followed by two digits, a decimal point and a further 6 digits. For longitude the first character is “E” and this is automatically entered. You should then enter 3 digits before the decimal point and 6 after. These formats were taken from the completed example that was sent.

For question 17 the names of the crops are available on a drop-down list. The crops appear in the list in alphabetical order. If a crop is recorded that is not in the standard list then the database will give the option of adding this crop to the list in the database in which case it will assign the next available code.

Section 2 of the questionnaire – **Legume Production** – is on the next screen; click the **Legume Production** button to move there.

Navigation Buttons

The buttons at the bottom of the screen are navigation buttons. The first 4 are:

- Go to the first record
- Go to the previous record
- Go to the next record
- Go to the last record

The next 3 are:

- Add new record
- Save record
- Close form

Legume Production

As you move into the next screen the Household ID will automatically be carried across. The first part of the screen is as shown in Figure 4 - Legume Production ScreenFigure 4.

Figure 4 - Legume Production Screen

2. LEGUME PRODUCTION

2.1 Which legumes does your household grow and which inputs do you apply in 2012 Short rains (SR) and 2013 long rains (LR)

Name of Legume grown	<input type="checkbox"/>	Rank 3 most important	Manure 1=Yes 0=No		Fertiliser 1=Yes 0=No		Name of fertiliser e.g. DAP		Pesticide 1=Yes 0=No		Hired labour 1=Yes 0=No		Family labour 1=Yes 0=No	
			2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013
			Common bean	<input checked="" type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼
Groundnut	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼
Soybean	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼
Cowpea	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼
Climbing bean	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼
Bambara nuts	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼
Pigeon pea	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼
Chickpea	<input type="checkbox"/>		▼	▼	▼	▼			▼	▼	▼	▼	▼	▼

For each legume you must tick the check box at the start of the row before you will be able to enter any values into any of the other columns. On any row if you enter 0 for the fertiliser column you will automatically skip the name of fertiliser column.

Agronomic Practices

The first sub-form is for agronomic practices – as far as possible items are available from drop-down lists. There is space to enter 3 crops for each season, 2 seed sources and 2 sources of advice.

Figure 5 - Agronomic Practices

3. List the agronomic practices of the important legumes that you grow *(Fill one row for each season)*

Legume	Season 1=2012 SR 2=2013 LR	Variety Local name	Variety Release name	Year first grown	Area planted (acres)	Total harvest 2012 SR <small>(State units and convert to kg)</small>	Planting method 1=Row, 2=Broadcast <small>(If row state actual spacing)</small>	Crops previously grown on the plot 1.Last season 2.Last year	Cropping 1=intercrop 2=mixed crop 3=sole stand 4=other	Seed source 1=own 2=neighbour 3=market 4=Agro-shop 5=Other	Source of advice on pests and diseases management	Plot manager 1=Men 2=Women 3=Joint

Record: 1 of 1 No Filter Search

Legume Pests

The next sub-form, shown below in Figure 6, is for the pests. You will need to enter each pest on a separate row and for each you must repeat the legume name. Figure 6 shows an example of this with two pests for Common bean.

Figure 6 - Legume Pests

3. LEGUME DISEASES AND MANAGEMENT

3.1 Name important pests that you experience on your farm and what control methods you use

Legume name	Rank 1=most important	List 3 most important Pests	Control methods used	If chemicals are used, name the chemicals	Frequency of chemical application
Common bean	1	Aphids			
Common bean	2	Bean fly			

Record: 3 of 3 No Filter Search

Note that the list of pests will vary according to the legume selected. If a pest is entered that is not in the list for the selected legume then you will have an option of adding the new pest to the list.

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The lookup table for pests has a primary key which combines the code for the legume with the code for the pest. Thus “thrips” for Common bean has the code of 110 whereas for soybean it is 403. The full list of codes is shown below.

LEGUME	KEYCODE	CODE	LABEL
Common bean	101	01	Aphids
Common bean	102	02	Bean fly
Common bean	103	03	Bollworms
Common bean	104	04	Foliage beetles
Common bean	105	05	Grey weevils
Common bean	106	06	Leafhoppers
Common bean	107	07	Plant bugs
Common bean	108	08	Pod borers
Common bean	109	09	Rabbits
Common bean	110	10	Thrips
Common bean	111	11	Semi loppers
Common bean	112	12	Stripped bean weevils
Common bean	113	13	Grasshoppers
Common bean	114	14	Crickets
Common bean	115	15	Leaf miners
Common bean	116	16	Spodoptera
Common bean	117	17	Whiteflies
Common bean	118	18	Rodents
Common bean	119	19	Lead hopper
Common bean	120	20	Other
Climbing bean	201	01	Aphids
Climbing bean	202	02	Bean fly
Climbing bean	203	03	Bollworms
Climbing bean	204	04	Foliage beetles
Climbing bean	205	05	Grey weevils
Climbing bean	206	06	Leafhoppers
Climbing bean	207	07	Plant bugs
Climbing bean	208	08	Pod borers
Climbing bean	209	09	Rabbits
Climbing bean	210	10	Thrips
Climbing bean	211	11	Semi loppers
Climbing bean	212	12	Stripped bean weevils
Climbing bean	213	13	Grasshoppers
Climbing bean	214	14	Crickets
Climbing bean	215	15	Leaf miners
Climbing bean	216	16	Spodoptera
Climbing bean	217	17	Whiteflies
Climbing bean	218	18	Rodents
Climbing bean	219	19	Lead hopper

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LEGUME	KEYCODE	CODE	LABEL
Climbing bean	220	20	Other
Groundnut	301	01	Leaf hoppers
Groundnut	302	02	Thrips
Groundnut	303	03	Plant bugs
Groundnut	304	04	Crickets
Groundnut	305	05	Grasshoppers
Groundnut	306	06	Others
Soybean	401	01	Foliage beetles
Soybean	402	02	Grey weevils
Soybean	403	03	Thrips
Soybean	404	04	Leafhoppers
Soybean	405	05	Plant bugs
Soybean	406	06	Grasshoppers
Soybean	407	07	Other
Pigeon pea	501	01	Aphids
Pigeon pea	502	02	Bean fly
Pigeon pea	503	03	Thrips
Pigeon pea	504	04	Bollworm
Pigeon pea	505	05	Pod borers
Pigeon pea	506	06	Foliage beetles
Pigeon pea	507	07	Flower thrips
Pigeon pea	508	08	Plant bugs
Pigeon pea	509	09	Mites
Pigeon pea	510	10	Leaf hoppers
Pigeon pea	511	11	Other
Chickpea	601	01	Aphids
Chickpea	602	02	Bean fly
Chickpea	603	03	Thrips
Chickpea	604	04	Bollworm
Chickpea	605	05	pod borers
Chickpea	606	06	Foliage beetles
Chickpea	607	07	Flower thrips
Chickpea	608	08	Plant bugs
Chickpea	609	09	Mites
Chickpea	610	10	Leaf hoppers
Chickpea	611	11	Other
Cowpea	701	01	Aphids
Cowpea	702	02	Bean fly
Cowpea	703	03	Thrips
Cowpea	704	04	Bollworm
Cowpea	705	05	Pod borers
Cowpea	706	06	Foliage beetles

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LEGUME	KEYCODE	CODE	LABEL
Cowpea	707	07	Flower thrips
Cowpea	708	08	Plant bugs
Cowpea	709	09	Mites
Cowpea	710	10	Leaf hoppers
Cowpea	711	11	Other
Bambara nuts	801	01	Leaf hoppers
Bambara nuts	802	02	Thrips
Bambara nuts	803	03	Plant bugs
Bambara nuts	804	04	Crickets
Bambara nuts	805	05	Grasshoppers
Bambara nuts	806	06	Others
Lablab/mucuna/canvalia	901	01	Mites
Lablab/mucuna/canvalia	902	02	Bollworm
Lablab/mucuna/canvalia	903	03	Pod borers
Lablab/mucuna/canvalia	904	04	Foliage beetle
Lablab/mucuna/canvalia	905	05	Leaf feeding caterpillars
Lablab/mucuna/canvalia	906	06	Aphids
Lablab/mucuna/canvalia	907	07	Flower beetle
Lablab/mucuna/canvalia	908	08	Thrips
Lablab/mucuna/canvalia	909	09	Stink bug
Lablab/mucuna/canvalia	910	10	Other

Legume Diseases

On the next page you will first go into the sub-form for the diseases. This should be completed in a similar way to the Pests sub-form shown earlier, i.e. a separate row for each disease and up to 3 diseases for each legume. Here again the list of diseases will vary according to the selected legume and you must choose the legume first. You have the option to add new diseases to the list. The disease list is similar to the pest list in that the key field is a combination of the code for the legume plus the code for the disease. The full list is shown below:

LEGUME	KEYCODE	CODE	LABEL
Common bean	101	01	Angular leaf spot
Common bean	102	02	Bean root rot
Common bean	103	03	Leaf rust
Common bean	104	04	Others
Climbing bean	201	01	Angular leaf spot
Climbing bean	202	02	Bean root rot
Climbing bean	203	03	Leaf rust
Climbing bean	204	04	Others
Groundnut	301	01	Early leaf spot (ELS)
Groundnut	302	02	Late leaf spot (LLS)
Groundnut	304	04	Alternaria leaf spot (ALS)
Groundnut	305	05	Asochyta blight (AB)

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LEGUME	KEYCODE	CODE	LABEL
Groundnut	306	06	Other
Soybean	401	01	Leaf rust (LR)
Soybean	402	02	Common bacterial blight (CBB)
Soybean	403	03	Septoria leaf spot (SLS)
Soybean	404	04	Others
Pigeon pea	501	01	Cercospora leaf spot (CLS)
Pigeon pea	502	02	Common bacterial blight (CBB)
Pigeon pea	503	03	Ascochyta blight (AB)
Pigeon pea	504	04	Alternaria leaf spot (ALS)
Pigeon pea	505	05	Other
Chickpea	601	01	Cercospora leaf spot (CLS)
Chickpea	602	02	Common bacterial blight (CBB)
Chickpea	603	03	Ascochyta blight (AB)
Chickpea	604	04	Alternaria leaf spot (ALS)
Chickpea	605	05	Other
Cowpea	701	01	Cercospora leaf spot (CLS)
Cowpea	702	02	Common bacterial blight (CBB)
Cowpea	703	03	Ascochyta blight (AB)
Cowpea	704	04	Alternaria leaf spot (ALS)
Cowpea	705	05	Other
Bambara nuts	801	01	Early leaf spot (ELS)
Bambara nuts	802	02	Late leaf spot (LLS)
Bambara nuts	804	04	Alternaria leaf spot (ALS)
Bambara nuts	805	05	Asochyta blight (AB)
Bambara nuts	806	06	Other

Figure 7 shows the Diseases sub-form.

Figure 7 - Legume Diseases

3.1 Name important diseases you experience on your farm and what control methods you use

Legume name	Disease name	Rank 1=most important	Control methods used	If chemicals are used, name the chemicals	Frequency of chemical application

Record: 1 of 1 | No Filter | Search

The final questions are shown in Figure 8. Note that there are buttons to move you back to the previous page and to page 1.

Figure 8

4.0 How do you decide when to spray chemical?

1. When I see pests 2. Follow a regular program 3. Other (specify)

Other, specify:

5.1 Have you ever changed a legume crop or variety due to pest attack? 1=Yes, 0=No:

5.2 Have you ever changed a legume crop or variety due to disease attack? 1=Yes, 0=No:

6. Other observations/challenges in legume farming

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Disease Field Survey

This form is for the sheet titled "Plant Disease Score Sheet" and this is shown in Figure 9. This screen includes a sub-form and requires some explanation. The top part of the screen should be straightforward. The farmer ID matches the Household ID on the Legume Socio-economic survey and that questionnaire must have been entered before entering this one.

The other components of the primary key for this sheet are the crop name and the variety and these must be entered before the record can be saved.

The sub-form is for the disease level with one record in the sub-form for each disease.

Figure 9 - Disease Field Survey

Plant Disease Score Sheet

Farmer ID: Crop: Variety:

Farmer name: _____ Village: _____ Date: _____

Latitude: _____ Longitude: _____ Elevation (M): _____

Crop mixture: _____ Fertility amendment: _____ Age of crop _____

Plot size: _____ District: _____ County: _____ AEZ: _____

Disease Name	Percentage of plants affected	Part affected	Distribution	Severity
<input type="text"/>		<input type="checkbox"/> root <input type="checkbox"/> stem <input type="checkbox"/> leaves <input type="checkbox"/> pods	<input type="text"/>	<input type="text"/>

Record: 1 of 1 | No Filter | Search

Pests Field Survey

The Pests field survey has three levels of nested forms and is shown in Figure 10. The top level is the Crop level and is identified by the farmer, crop and variety. These 3 fields must all be entered before the record can be saved and they are shown on the form in bold. The farmer ID is again on a drop-down list and the same conditions apply in that the farmer must be entered into the Legume socio-economic Survey before they can be entered here.

The other fields in the top section of this form should be straight-forward – text fields should have enough space to accommodate the data for those fields but if you find they are too short then please advise – if field sizes are currently less than 255 characters then they can be increased.

Nested Forms

The levels of nested forms here are to avoid having to enter the pest name several times. The section where you can see “Pest #” and “Name” can be referred to as the “Pest” level – this pest level form has the orange border and in the footer of this form you can see navigation buttons to take you to the previous pest record, the next pest record or to add a new pest record.

The innermost form is the plant level and this will display as a formatted table.

Figure 10 - Legume Pests Field Survey

Legume Pests Field Survey Data Sheet

Farmer ID: District: Division:

Latitude (+/-dd.dddddd): Longitude (ddd.dddddd): Elevation (mmmm):

Farmers name: Legume species:

Researcher: Crop mixture:

Date and time: Legume varieties: Variety sampled:

Size of field: Soil fertility amendments: Age of crop:

Pest #: Name:

Plant No.	Incidence	Severity
<input type="text"/>	<input type="text"/>	<input type="text"/>

Record: 1 of 1 | No Filter | Search

As an example Figure 12 shows the completed data for pest number 2 (leaf hopper) – to enter data for the next pest you would need to click the Add record button highlighted in Figure 11. Note this button is for adding another pest record – the similar button at the very bottom of the main form is for adding another record at the top level – i.e. the crop/variety or plot level.

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Figure 11 - Add record button

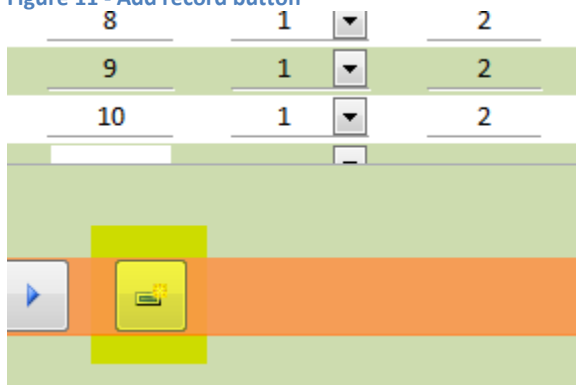


Figure 12 - Example for pest 2

