

The James Hutton Institute's Potato Disease Diagnostic Tool

A low cost infield diagnostic tool that aims to further strengthen sustainable potato production

Project Aim

- Aim of the project is to develop a diagnostic phone application to aid the field diagnosis of potato disease for the James Hutton Institute Malawi potato project.

Background

- Professor Lesley Torrance is the leader of the cell and molecular science group at the James Hutton Institute.
- Runs a project on strengthening potato production in Malawi.
- The project has had several achievements.
- Aims for this application to further strengthen potato production.

Specification

- Requirements:
 - Searchable glossary
 - In field test videos in application
 - Decision support tool
 - Zoom into images
 - Image sharing
 - Update data in application
- Non- Functional Requirements:
 - Must work offline
 - Must not use a lot of battery
 - The application should be scalable
 - Android or Iphone

Design Decisions

- Agile method – 2 sprints – 7 days for each sprint
- Android application.
- SQLite database.
- PHP based website.

Sprint's

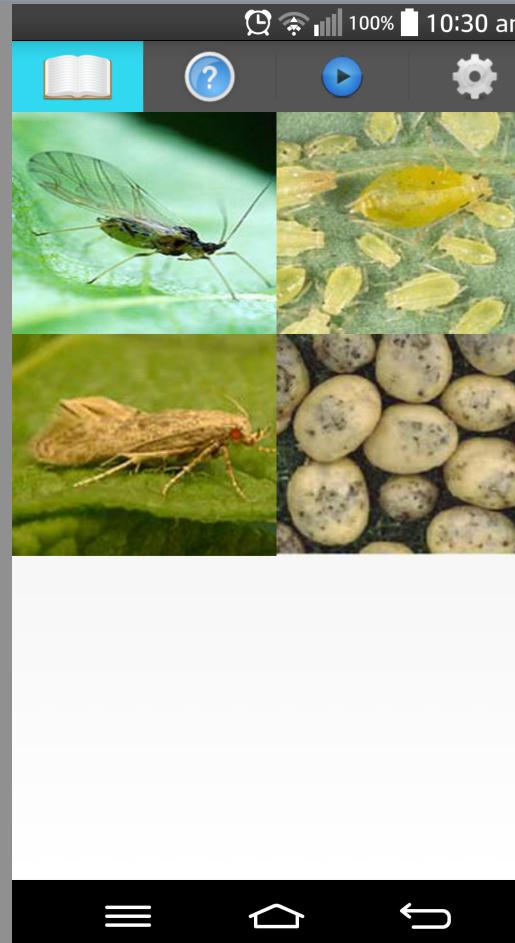
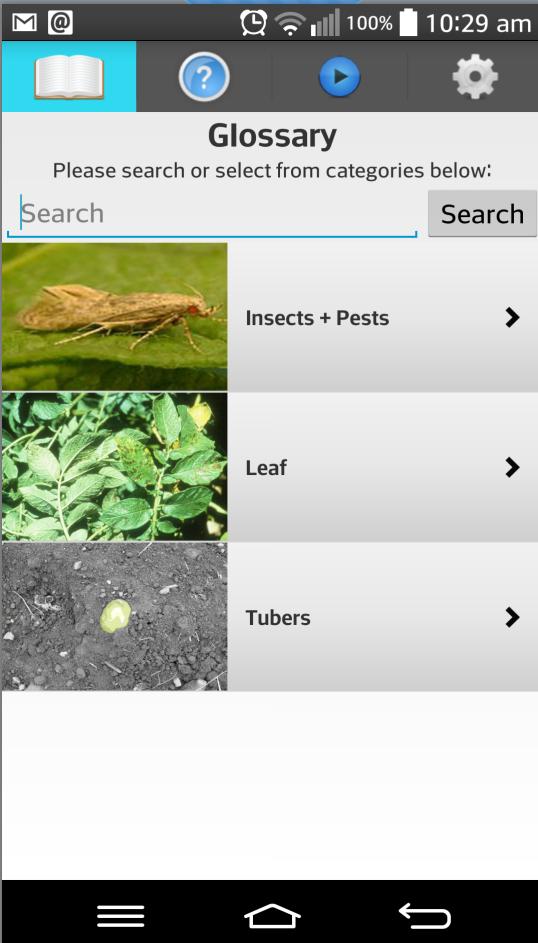
Sprint 1:

- Searchable glossary
- Test videos in the application

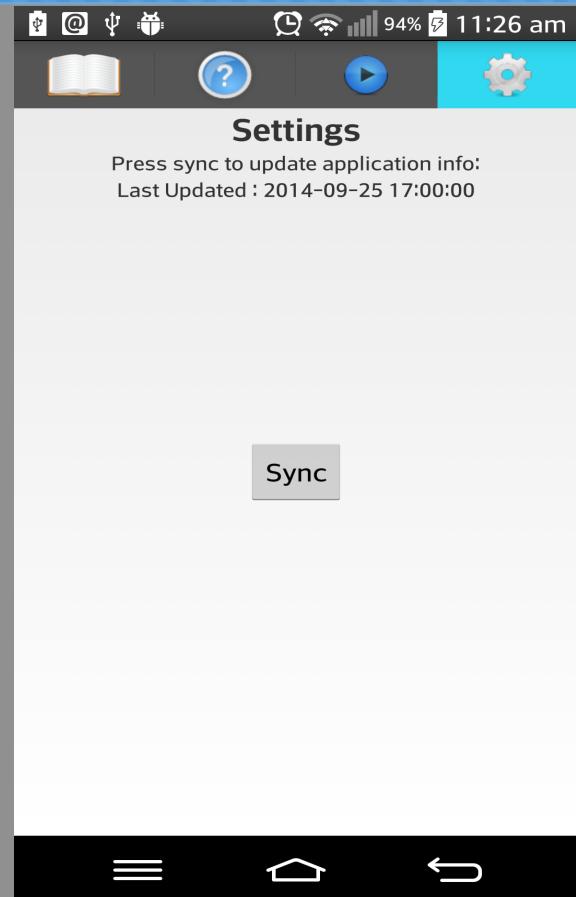
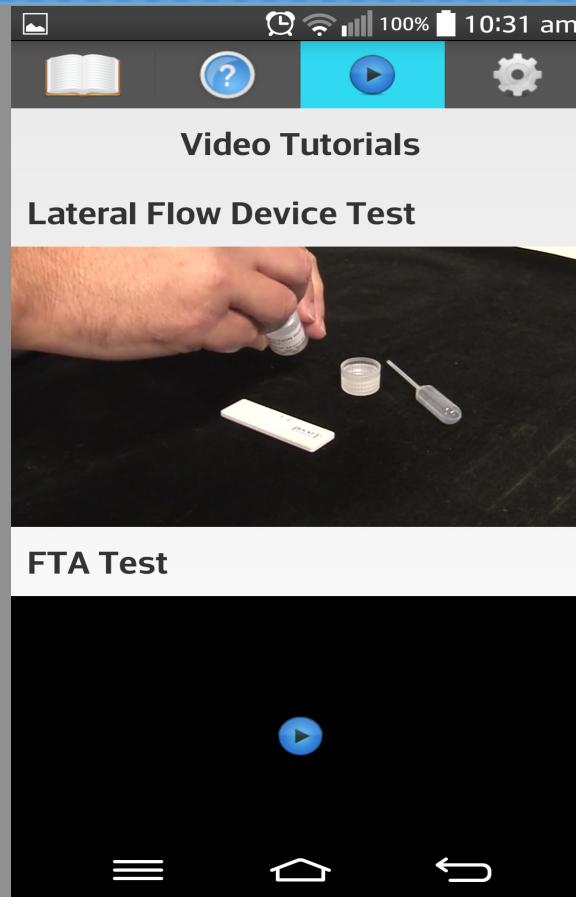
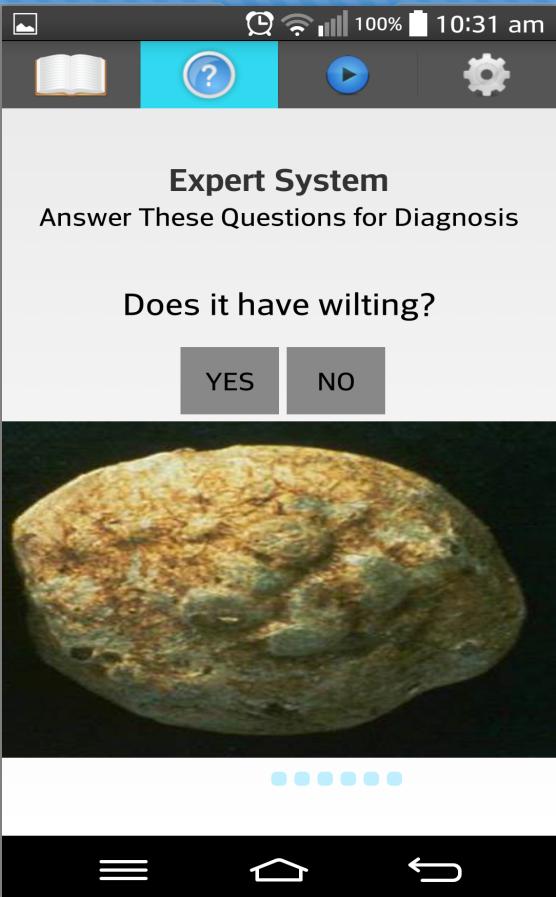
Sprint 2:

- Changes from sprint 1
- Decision support tool
- Zoom functionality
- Mock website with possibility of update

Demo



Demo



Demo

The James Hutton Institute Diagnosis Tool Admin Portal

Please sign in.

Sign in

The James Hutton Institute Diagnosis Tool Admin Portal

View Current Data

Insert New Data

View Current Potato Diseases

Disease	Type
Pectobacterium Atrosepticum	Leaf
Dickeya Solani	Leaf
Brown Rot or Bacterial Wilt (<i>Ralstonia Solanacearum</i>)	Leaf
Early blight (<i>Alternaria Solani</i>)	Leaf
Late blight (LB; <i>Phytophthora Infestans</i>)	Leaf
Potato Virus Y	Leaf
Potato Virus X	Leaf
Potato Leafroll Virus	Leaf
Common Scab (<i>Streptomyces Scabies</i>)	Tubers
Black Scurf (<i>Rhizoctonia Solani</i>)	Tubers
Fusarium Dry Rot/Wilt (<i>Fusarium spp.</i>)	Tubers
Root Knot Nematode (RKN; <i>Meloidogyne spp.</i>)	Tubers
Late Blight (LB; <i>Phytophthora Infestans</i>)	Tubers
Aphids	Insects + Pests
Tuber Moth	Insects + Pests

Demo

View Current Data >

Insert New Data > **Insert New Data**

Insert New Potato Disease

Disease
Enter disease...

Type:
Tubers

File input: Image 1
 No file selected.

File input: Image 2
 No file selected.

File input: Image 3
 No file selected.

File input: Image 4
 No file selected.

File input: Image 5
 No file selected.

File input: Image 6
 No file selected.

Basic Facts
Enter some basic facts...

Control

Detailed Look

Disease
Pectobacterium Atrosepticum

Type:
Leaf

Basic Facts
Generally more likely to cause disease in cool wet climates. Plants are often stunted with leaf yellowing and stems are black and slimy at base. The foliage wilts as the plant ages. Tubers develop soft rot usually from the stolon end but under very wet condition rots from individual lenticels can develop.

Control
Dig up affected plants and place foliage and tubers in bags for destruction away from field. Do not plant diseased tubers. Tubers are a source of infection and should be washed in disinfectant before storage. Clean and disinfect tools and equipment to avoid spreading infection.

Diagnostics
PCR test; press samples from leaf or stem onto FTA cards for lab test.

Update

User Testing

- 10 participants ranging from ages 21 – 50.
- User testing – Comments + SUS to evaluate testing
- Average SUS score of 81.3 giving us a grade A

Reflection

- Significant improvement on technical skills
- Real world industry experience
- Increased knowledge of potato disease
- Personal development skills from the provided sessions.

Future Work

- Improvement on website and syncing.
- Working with the James Hutton Institute to improve the expert system.
- Building on feedback given from user testing.
- Thanks for listening. Any questions ?