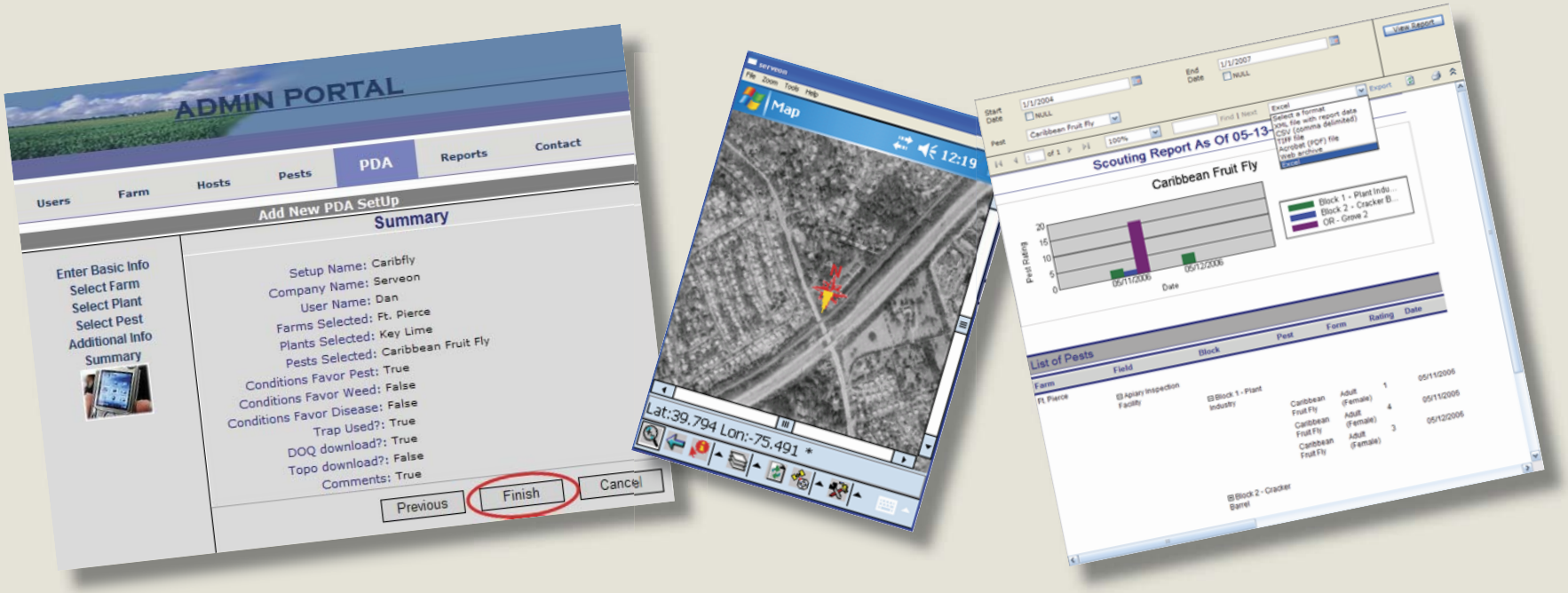
Internet-Based Survey and Modeling Systems for Agricultural Insects and Diseases

Fruit Fly, Canker and Greening Certification Programs



Steven Rogers, Herb Nigg, Isobel Clark, Daniel Hart, Reza Ehsani, Dave Brock & Ed Schuster

Digital, Interoperability and Immediacy

One of the driving forces behind the development of the technology we will describe is the need for better accessibility and interoperability in existing data.

"There is incredible untapped potential in unused data. Many of our most important research and marketing issues could be resolved today if existing agricultural information was digitally organized, interoperable and immediately accessible to the people who could make a difference."

— Steven Rogers, 2001

Caribbean Fruit Fly Free Protocol

The Caribbean fruit fly imposes a trade barrier to shipping Florida grapefruit to Japan. Fruit can only be shipped after being certified as “fly free”.

JAPAN

The single most important export market for Florida grapefruit

Country	1000x	Change
United States	1,811	-9.2
Canada	258	-26.7
Europe	577	-34.7
Japan	930	-36.3
Other	35	+75.0
Total	3,611	-23.3

Source: January 2006 Florida Citrus Economic Indicators, DOC

TASC Grant from the USDA–FAS

Technical Assistance for Specialty Crops grants are targeted to those areas that support marketing activities to foreign export partners.

TASC FlyNet Project #04010 Description	
Sponsor	USDA-FAS/Indian River Citrus League
Project Number	USDA TASC Agreement #04010
Quarter Report	First Quarter Report
Date of Report	February 2006
Report Version	Version 2/28/06-c (Cooperators)
Market	Market JA; Commodity: CITRS
Trade Barrier Type	Pest Lists & Database Development
Funding Year	Year 2 of 3
Funding Allocation	$242,000
Contact & Phone	Steven Rogers, 863-287-8587
Contact E-mail	steve@stever.com

Indian River Citrus League
Florida Department of Agriculture
United States Dept. of Agriculture
University of Florida
Mass. Institute of Technology
Ecostat, Inc.
Serveon, Inc.
Geostokos, LTD

FlyNet

FlyNet technology is based on a proven commercial-level pest survey platform used in several countries and crop domains since the mid-1990's.

Internet-based

Universal platform for any crop-pest domain

Science/Technology

Insect & Disease Certification
Rapid Scale-Up for New Diseases
Improved Preharvest Inspection
Less Paperwork & Forms Preservation
Automated Certification Reports
Improved Traceability
Combined Insect & Disease Surveys
Improved Pest Trend Modeling
Real-Time Data for Researchers
Easier Grower Pest Scouting
Faster Pest-Yield Relationship Analysis
...and many more.

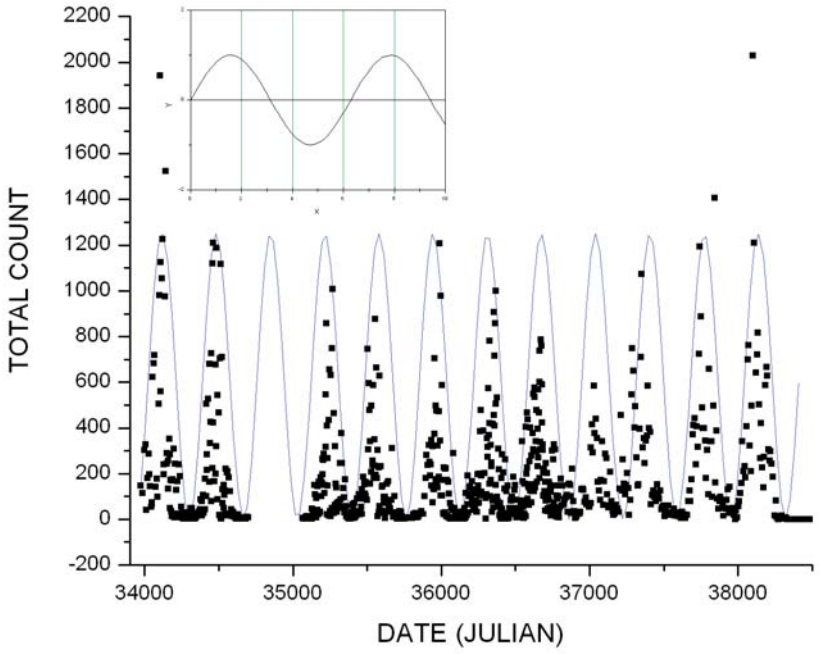
Fruit Flies, Canker, Greening and Others

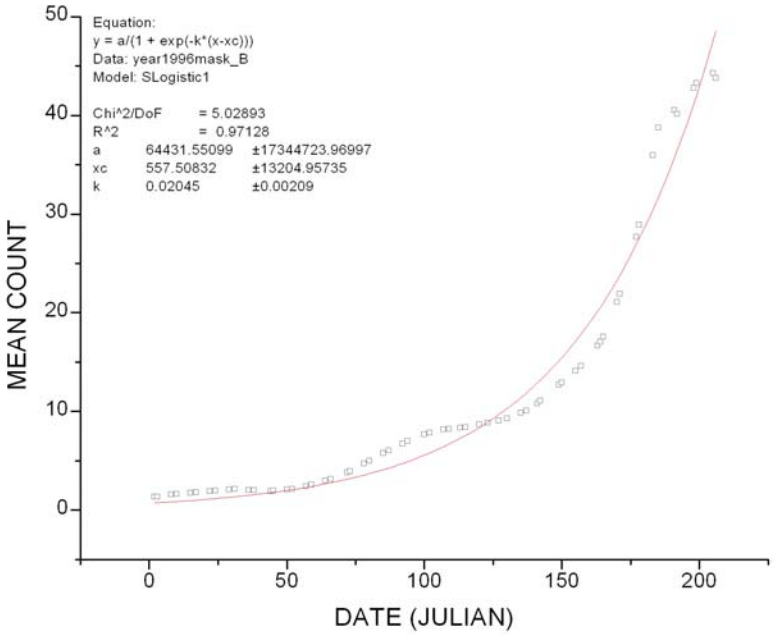
FlyNet can be repurposed within minutes if changes must be made in an inspection program due to introduction of a new exotic insect or disease.

- Short learning curve
- Individual customizable pest profiles for each user
- Full complement of data security features
- Flat and geographical OLAP cube reporting services
- ArcIMS-enabled
- Low hardware cost that includes full GPS capability
- No desktop software to install
- Wireless synchronization available

Logistic Model Describes Fly Growth

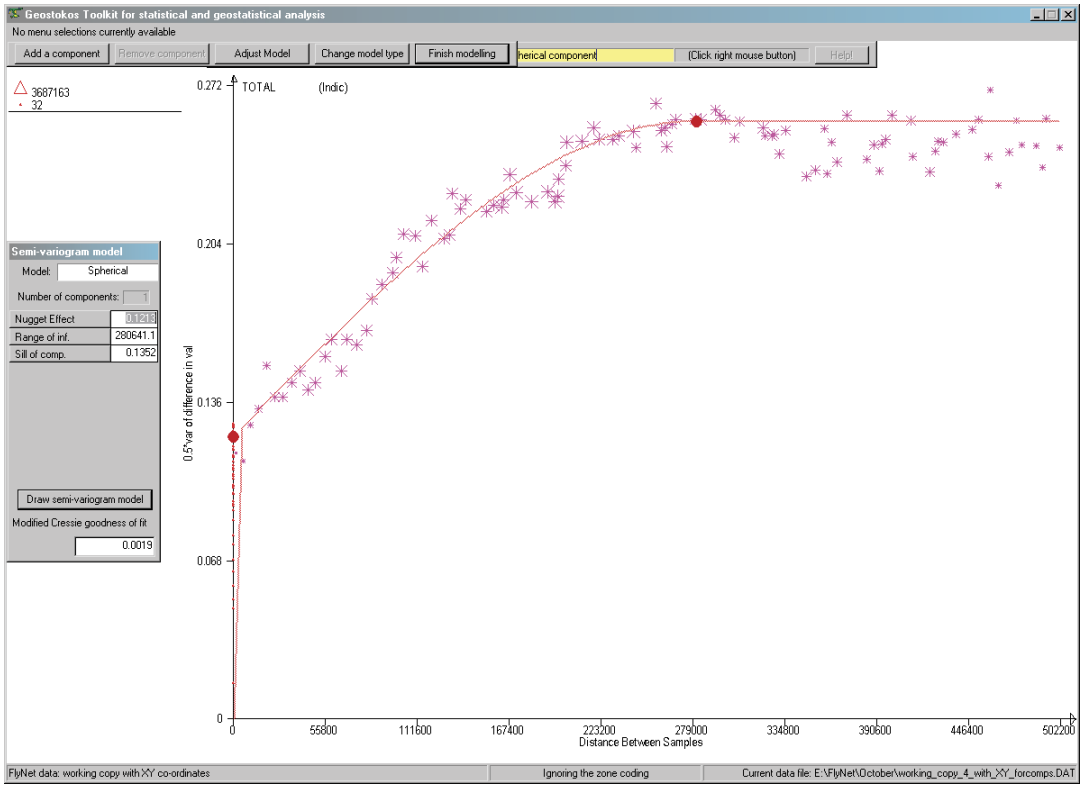
Parameters seem to align best with initial count, carrying capacity and temperature (and/or host fruiting) as the dominant development force.





Spherical Thirty-Mile Range of Influence

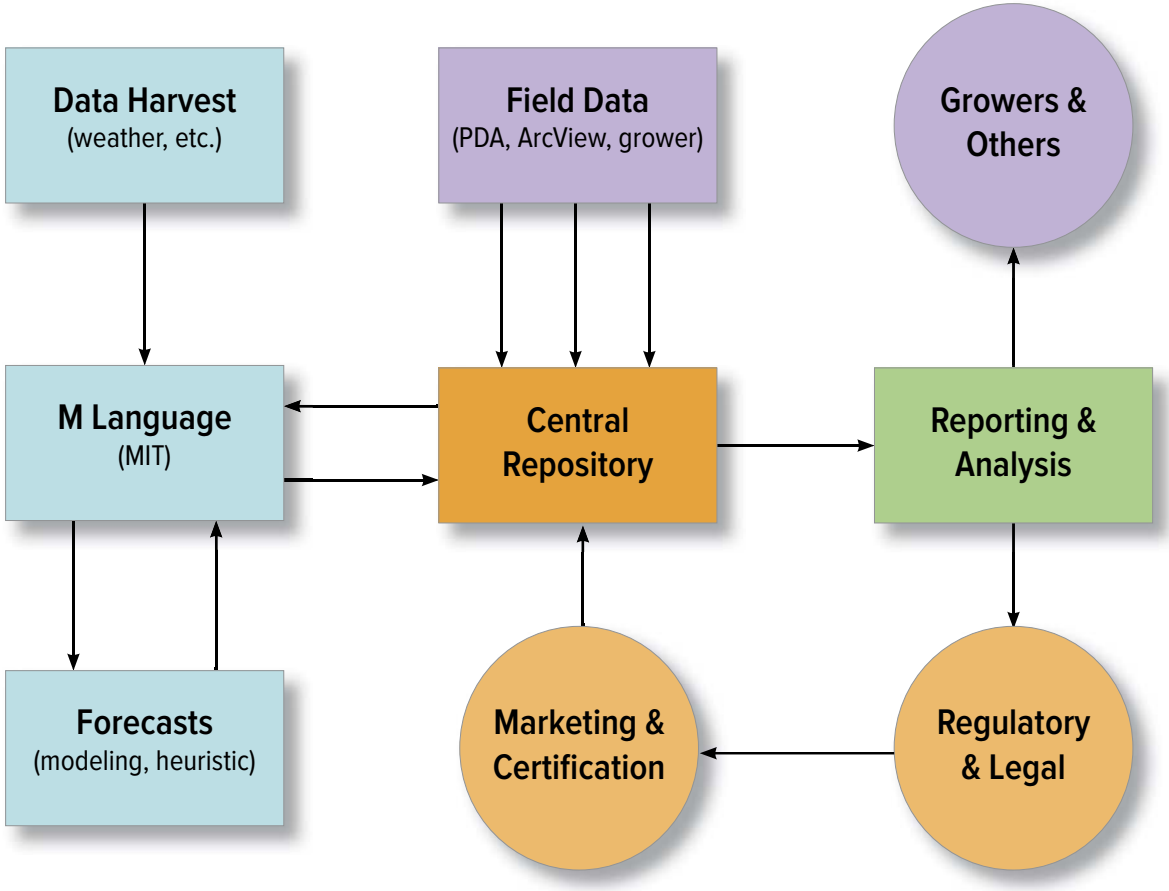
Geostatistical variography suggests there is a large nugget and an approx. 30-mile range of influence.



Binomial variography resulted in a better experimental variogram than using counts.

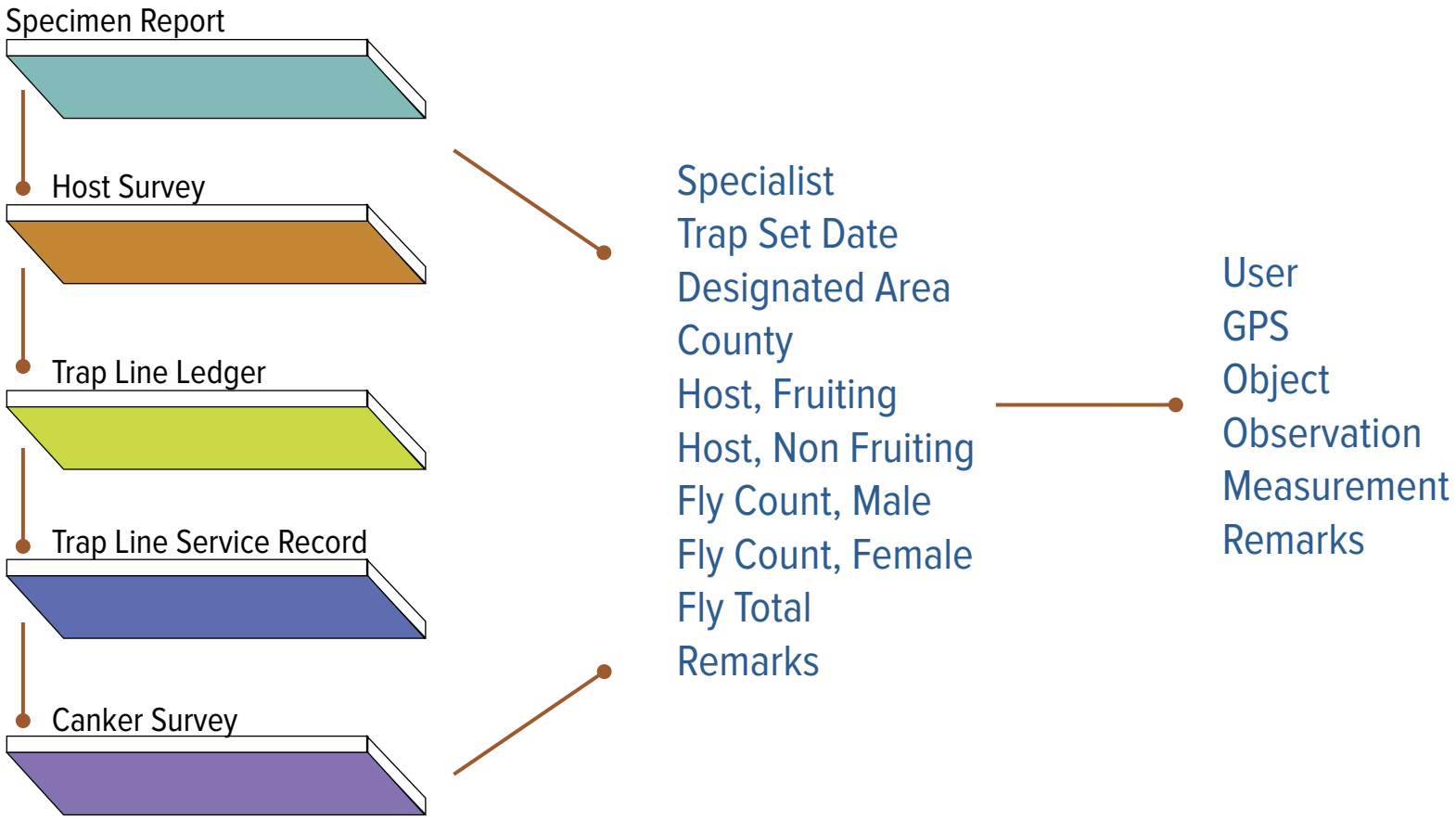
Central Repository is Interoperable

FlyNet is designed as an "M-prestaging" point. M is a project in cooperation with MIT to address interoperability between data sources.



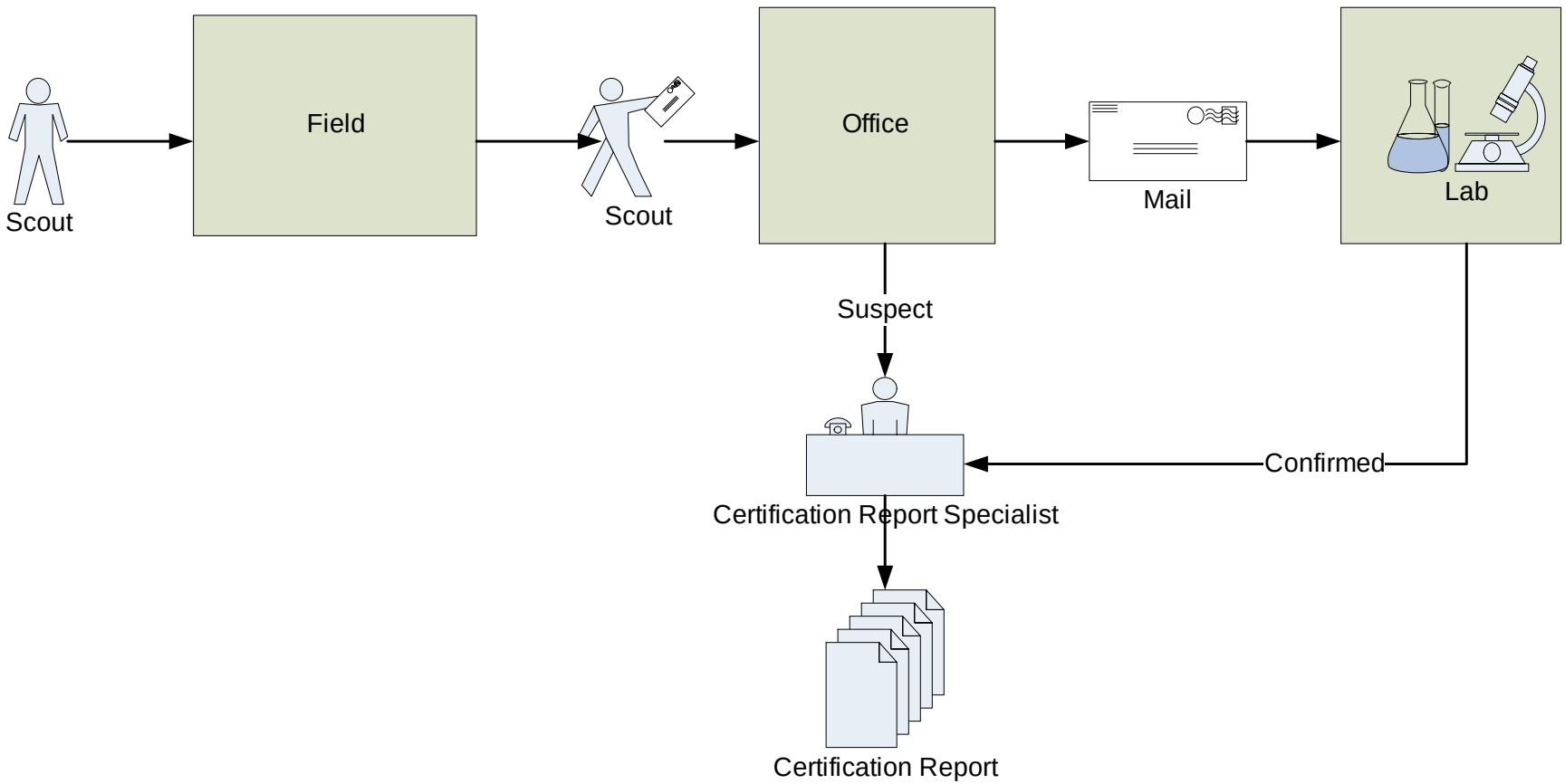
Duplicate Forms • Duplicate Data

Inspectors use several forms, transferring the same data from form to form. Digital and automated data acquisition would reduce duplicative efforts.



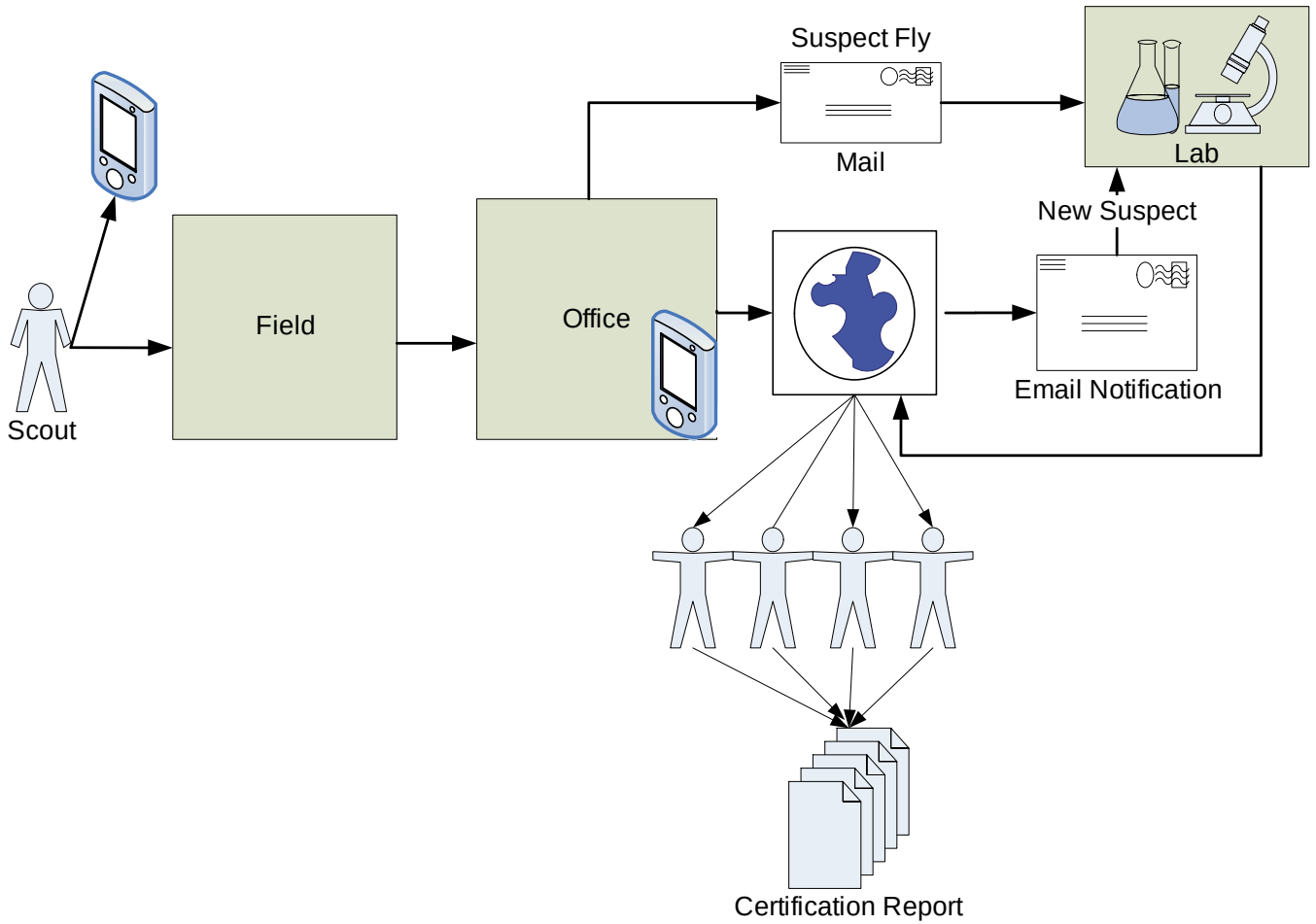
Current Data Management Process

Currrent data management procedures involve forms, snail mail and other paper-based documentation procedures.



Digital Data Management

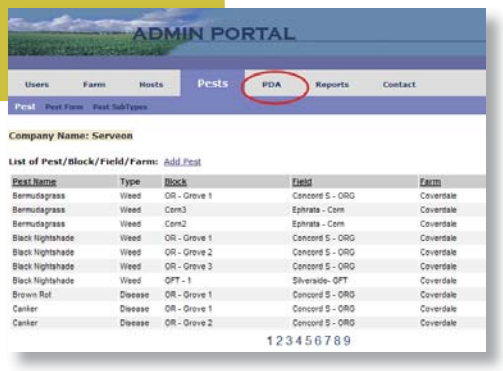
Redundant data is entered only once using validation procedures. Since all data types are system-resident, required forms can be automatically generated.



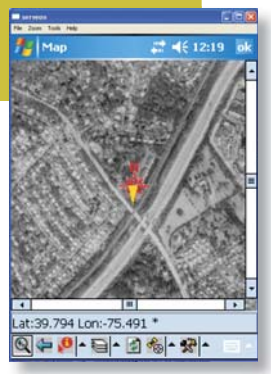
Three Main Steps to Using FlyNet

There is no desktop software. Users set up their PDA pest profiles from the FlyNet web portal, then download the profiles automatically during synchronization.

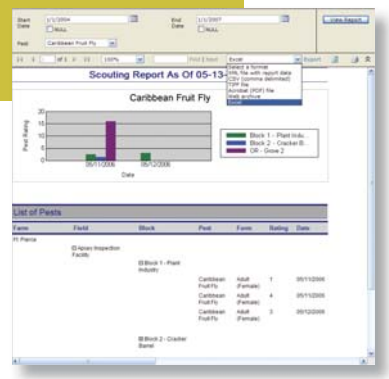
1 Web Admin



2 Collect Observations

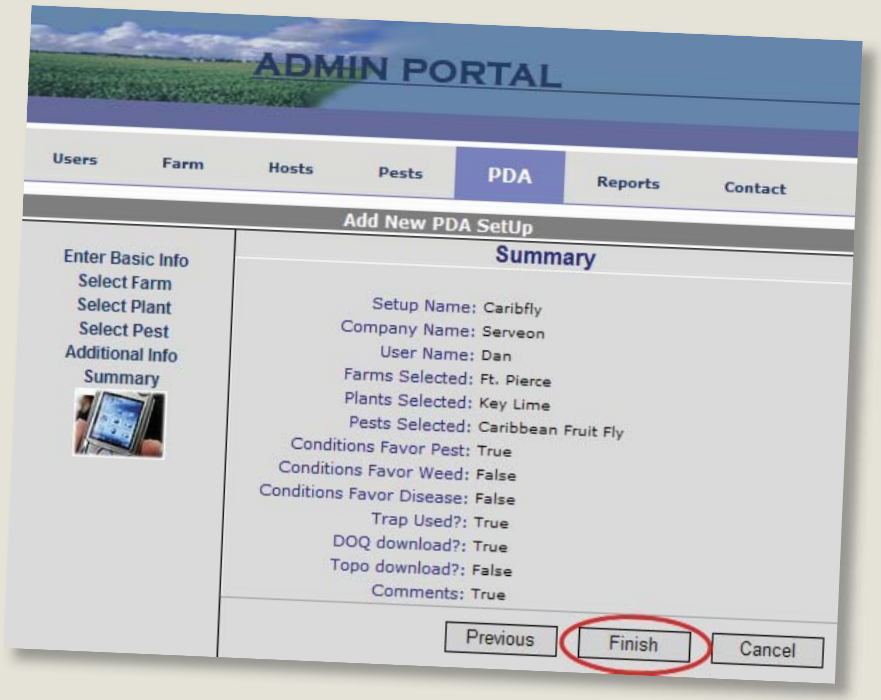


3 Generate Reports



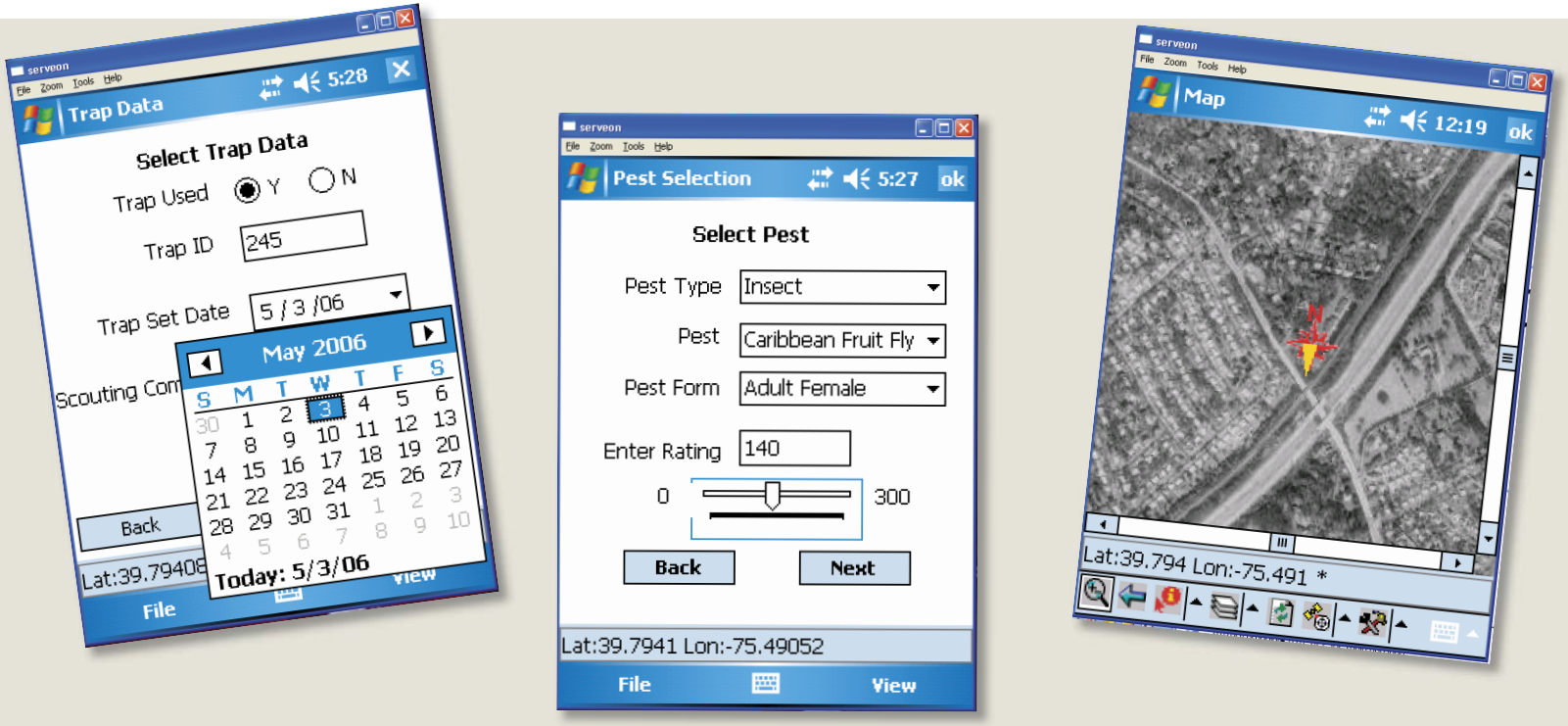
Step 1. Web Administration Portal

Inspection program design is performed using an online web administration portal. Profiles are downloaded to PDAs automatically during synchronization.



Step 2. Handheld PDAs Data Capture

HP Ipaqs are used since they provide a low-cost hardware solution, Internet and wireless synchronization capability and GPS and image-capture features.



Host and pest observations are captured and represented live on the PDA maps. Data can be wirelessly synchronized for improved update capabilities.

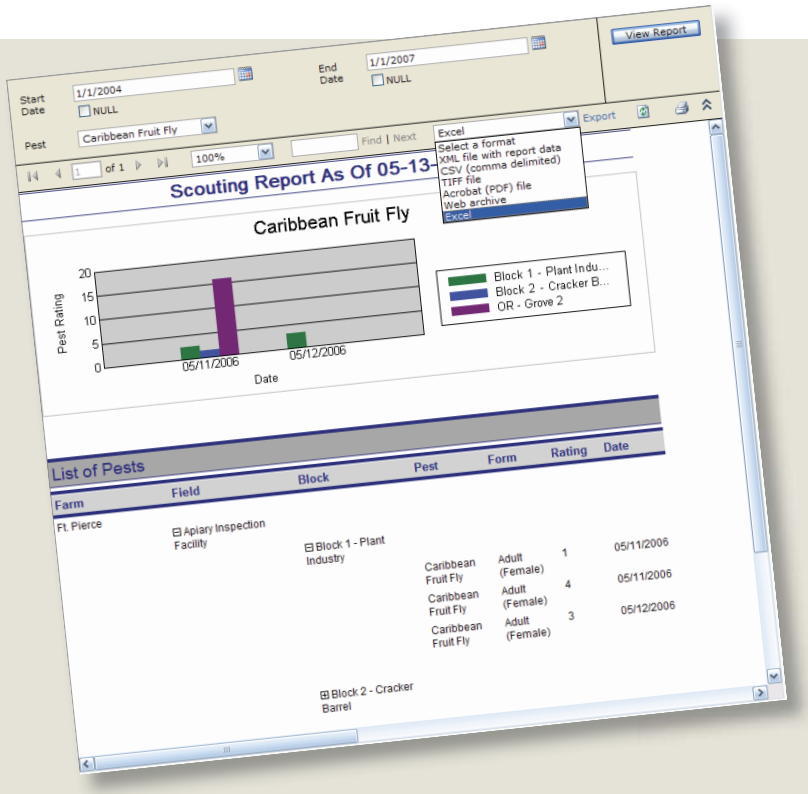
Step 3. Automated Reports Save Hours

Required forms can be generated automatically at pre-determined times. This saves hours of manual preparation time.

Content is automatically harvested from the resident database into which real-time information is being loaded.

Authorization protocols ensure that only approved reports are sent to recipients.

Data is exported to preferred formats for research purposes.



M Language–NOAA Weather Interoperability

Data interoperability will be leveraged using the M lanaguage. M is being developed at MIT in a consortium dedicated to finding commercial applications.

DESCRIPTOR	EXAMPLE
KEY	call.5
DEFINITION	call n. a telephone connection
SEMANTIC LINKS	**Synonyms**: phone call.1, telephone call.1 **Type of**: telephone.2, telephony.1 **Part of**:
SCHEMA	**Data**: ^[+][0-9]\d{2}-\d{3}-\d{4}$ **Attributes**: party.5, duration.1, telephone_number.1
LOCALIZATION	Data: Japanese, Chinese, Indian, Russian, German

FlyNet Pilot Program Being Established

Subject to ratification by the IRCL Board, a pilot program to test FlyNet technology is being established for fruit flies and canker on Florida's east coast.

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Published Saturday, May 20, 2006
FLORIDA CITRUS CANKER

Quarantine Might Be Averted

By KEVIN BOUFFARD
The Ledger

LAKELAND – A top Florida agriculture official expressed "cautious optimism" Friday that a new proposal – including weekly canker inspections in some citrus groves designated for the fresh fruit market – would avert a federally imposed canker quarantine across the state.

"On Monday of this week, it appeared we were heading into a statewide quarantine. At least now, they're discussing whether we'll be able to ship fresh fruit to citrus-producing states," said Craig Meyer, the deputy commissioner at the Florida Department of Agriculture and Consumer Services.

Meyer was referring to top officials at

The Shipping News

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FlyNet provides the universaility, interoperability and robust system architecture required for a rapidly changing agricultural pest profile in Florida.