AgriVectors.org

A Systems Biology resource for *Vector Biologists*

Data to Disease Management

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Agricultural Vectors Consortium

IECE 2021 The 1st International Electronic Conference on Entomology
01–15 JULY 2021 | ONLINE

Mueller Lab @ Boyce Thompson Institute

Open source toolkit

VAGRANT

Xen Project

docker

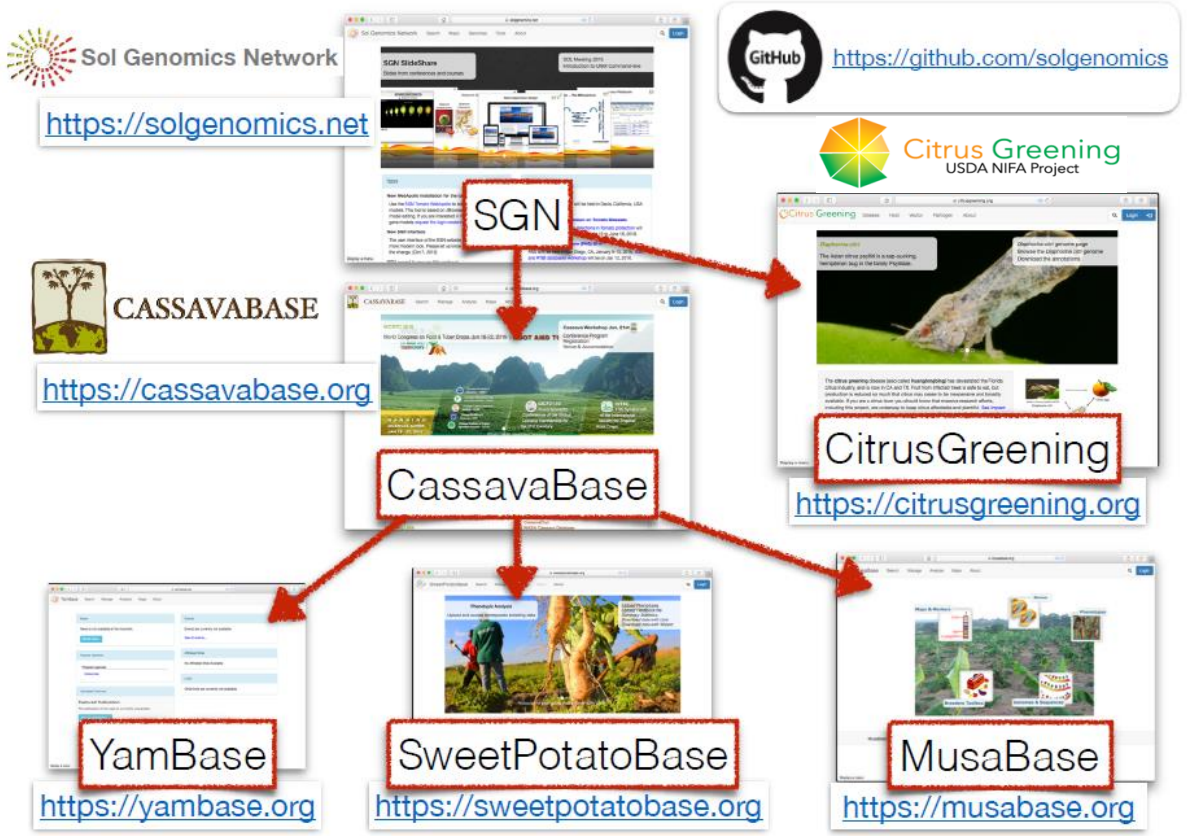
CHADO

JBrowse

Web Apollo

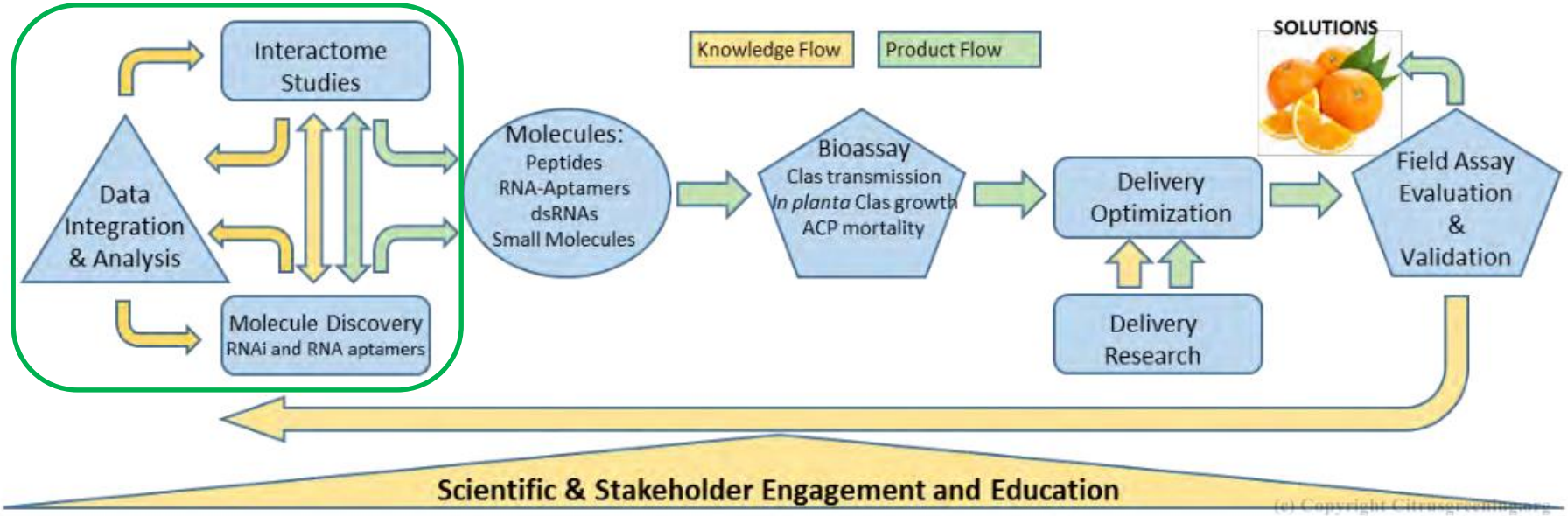
MAKER Annotate this!

Pathway Tools



BTI

Citrusgreening.org: Portal for the HLB disease complex



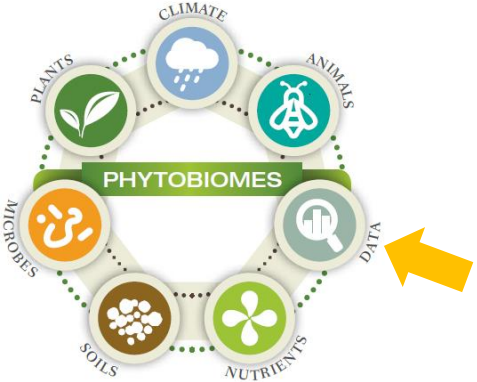
Omics resources and databases are <u>required</u> for identification of targets for interdiction

Genome

Pathway Databases
Expression Networks
.....

Annotation

Target for interdiction molecules



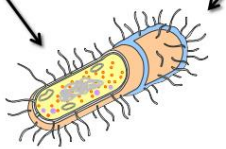
Vector

Asian citrus psyllid (ACP)
Diaphorina citri

Host

Citrus spp.

Pathogen



CLas
Candidatus Liberibacter asiaticus

Citrusgreening.org

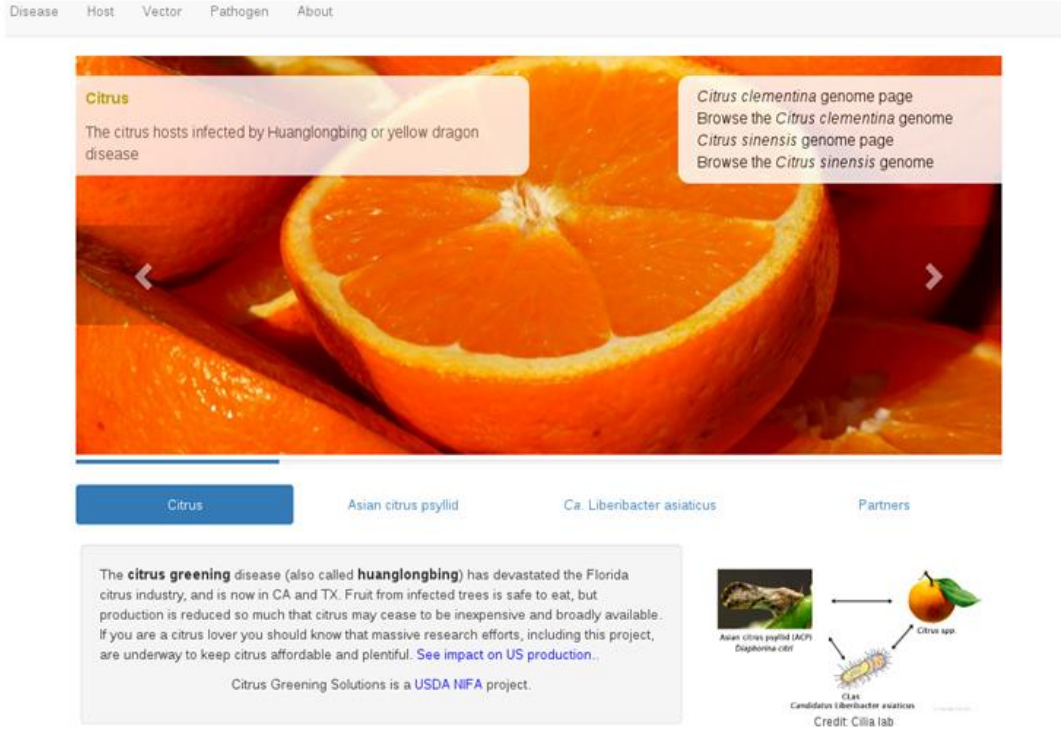
https://citrusgreening.org/

Host, Vector and Pathogen(s)
- Blast Databases
- Genome browser – Jbrowse
- Metabolic pathway database
- Annotation Editor – Apollo
- Psyllid Expression Network (PEN)
- FTP site for download

Disease background

News, Publications, Links

Social Media



Citrus Greening
USDA NIFA Project

DiaphorinaCyc Pathways overlaid with Gut RNAseq results

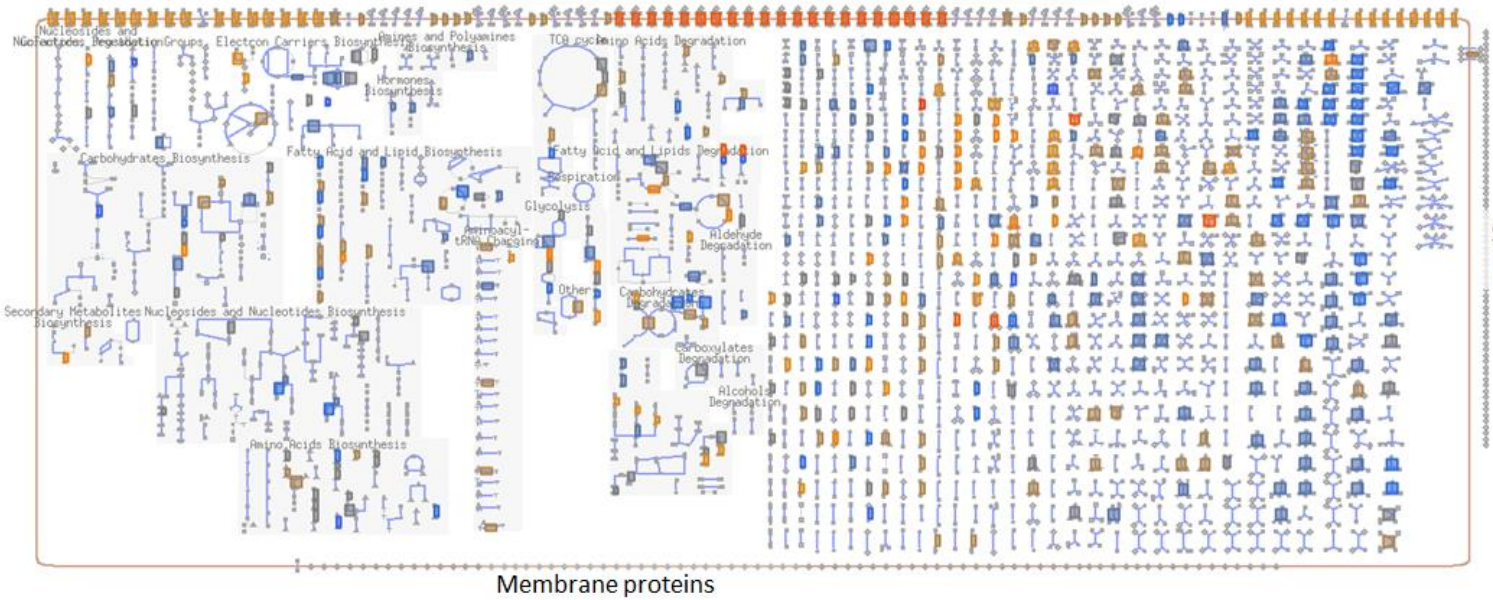
Pathways: 171
Enzymes: 3,507 (was 2,857)

Transport Reactions: 17
Proteins: 25,295 (was 12,548)

Transporters: 87
Compounds: 1193

Membrane proteins

http://ptools.citrusgreening.org/overviewsWeb/celOv.shtml



Secretory proteins

Membrane proteins

Cellular Overview of *Diaphorina citri* overlaid with RNAseq expression counts

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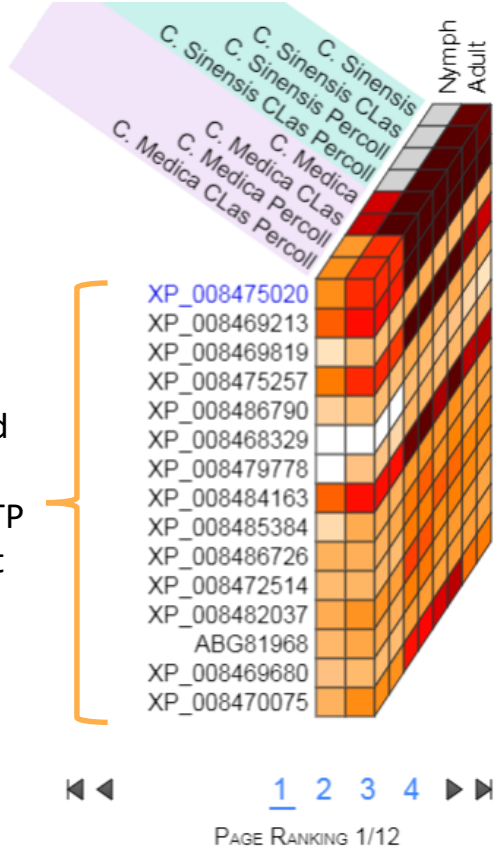
Kruse et al. 2017

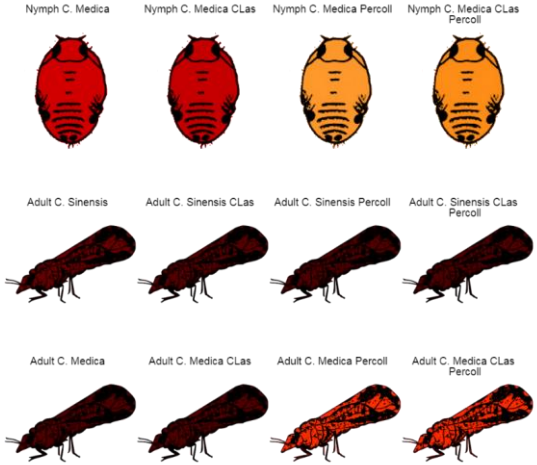
Proteomics results in Psyllid Expression Network



Genes correlated with XP_00847050 ATP synthase subunit beta

Tree Hosts: *C. medica* and *C. sinensis*
Treatment: Percoll gradient fractionation
Insect Stages: Nymph and adult
Conditions: Clas+ and healthy

Colored by level of expression



Citrus Greening
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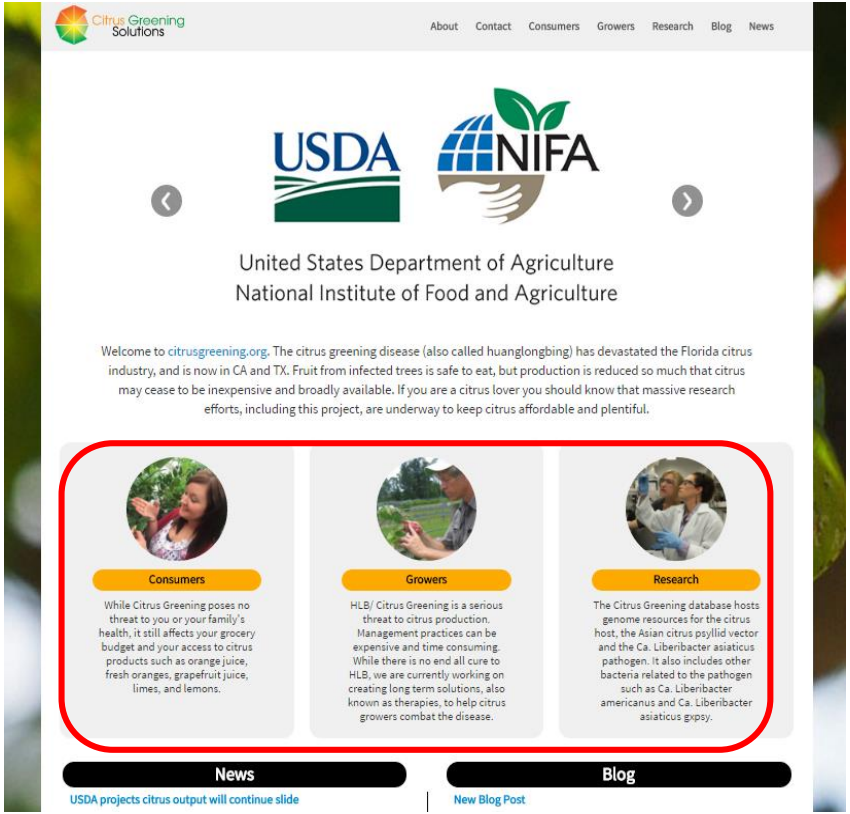
Outreach

- News
- Events
- Blog
- Publications



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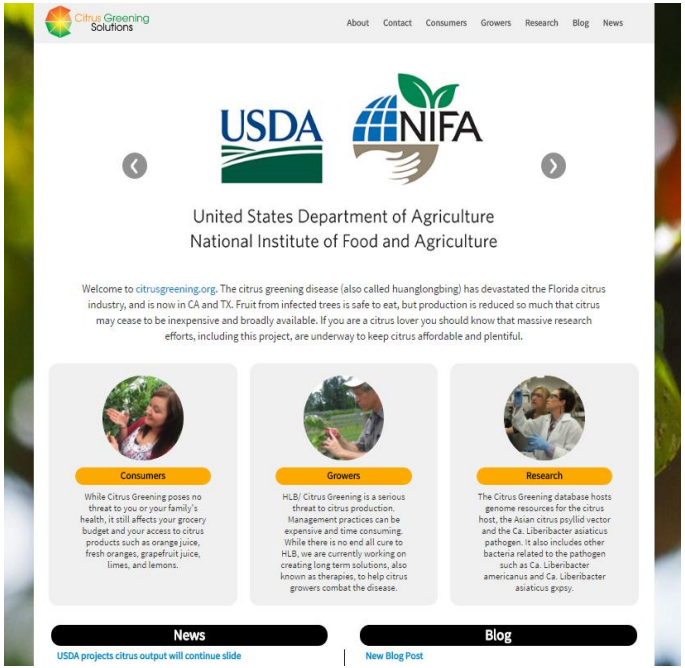
Portal for all Agricultural Disease Vector Systems



AgriVectors Home Page

Citrusgreening

Zebra chip

Andrew Jensen

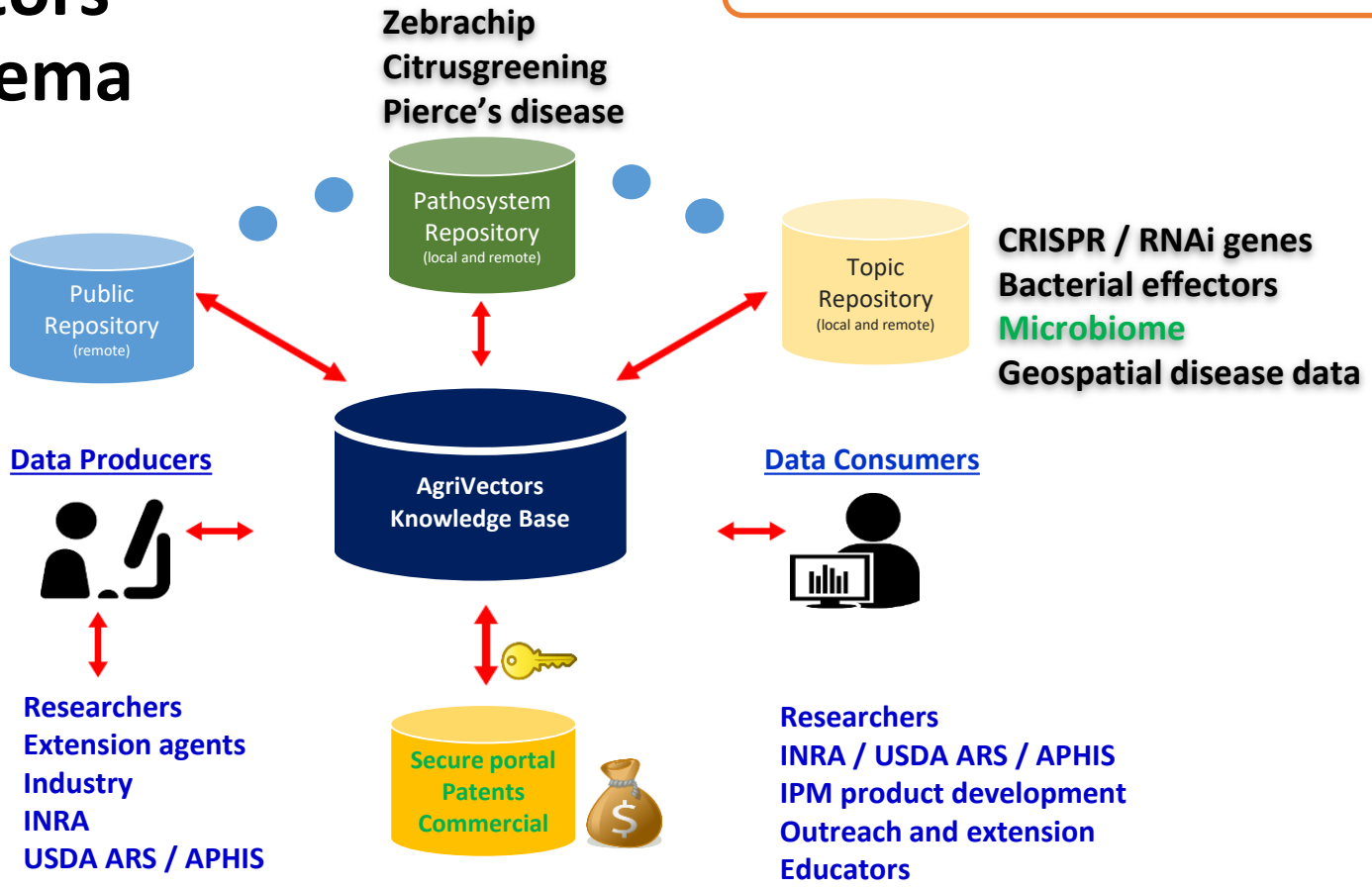
Pierce's disease

Alex Wild

Pathogens: Bacteria, virus and fungi

AgriVectors Data Schema

Improved Rapid Data Cluster Analyses and Access



Data types

Omics data sets

- Genome assembly and official annotation
- Transcriptomes
- Mass spectrometry proteomics

Population biology

- Insecticide resistance
- SNPs and Indels
- Variants
- Simple Sequence Repeats
- Mitochondrial genes

Data types

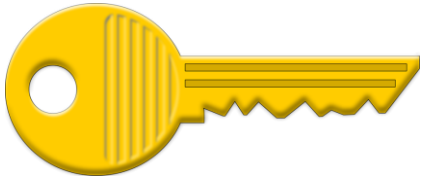
Integrated pest management <u>pathosystem-wide</u> data

- Inclusive of Vector, pathogen, host, environment and beyond...
- Gene family based data sets (P450, RNAi pathway)
- E.g. Virus, Bacteria, or fungal infection assays
- Electrical Penetration Graph (EPG) feeding data
- Phenotyping data from disease trials
- Ecological and climactic data
- Behavioral assays
- Toxicology, Insecticide resistance, etc.

Genes (structural and functional curation)

Publications, notes, posters, videos and abstracts……

Project ideas and Preliminary data



Salivary gland transcriptomics of hemipterans

- Host range based on orthologous enzymes and proteins
- Pathogen acquisition/transmission/…replication?
- Chemical and pathogen response

Host immunity based on pathogen exposure

Fecundity and development assays

Microbiome and virome characterization

Thank you!!

@Citrusgreening // @SahaSurya

#MakeDataGreatAgain