Food and Agriculture Organization of the United Nations

CIHEAM

Scientific Consultation and High-Level Meeting on Red Palm Weevil (RPW) Management

TOWARDS USER-FRIENDLY EARLY DETECTION ACOUSTIC DEVICES FOR RPW MANAGEMENT

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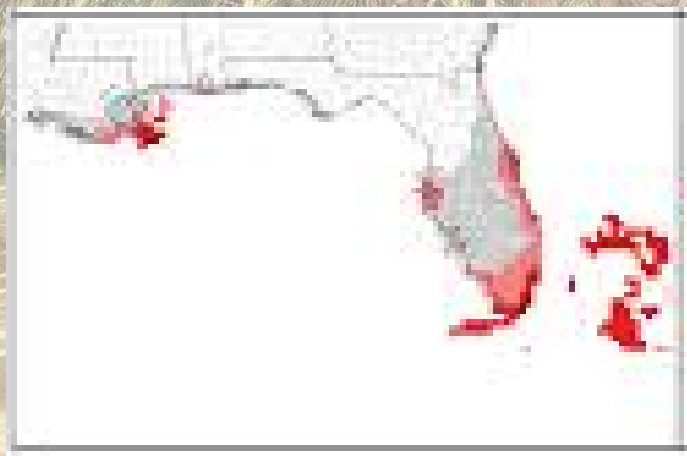
USDA ARS CMAVE
Gainesville, FL USA

Rome, 29-31 March, 2017

Climate-Based Potential Range of RPW

Southwest US

Southeast US



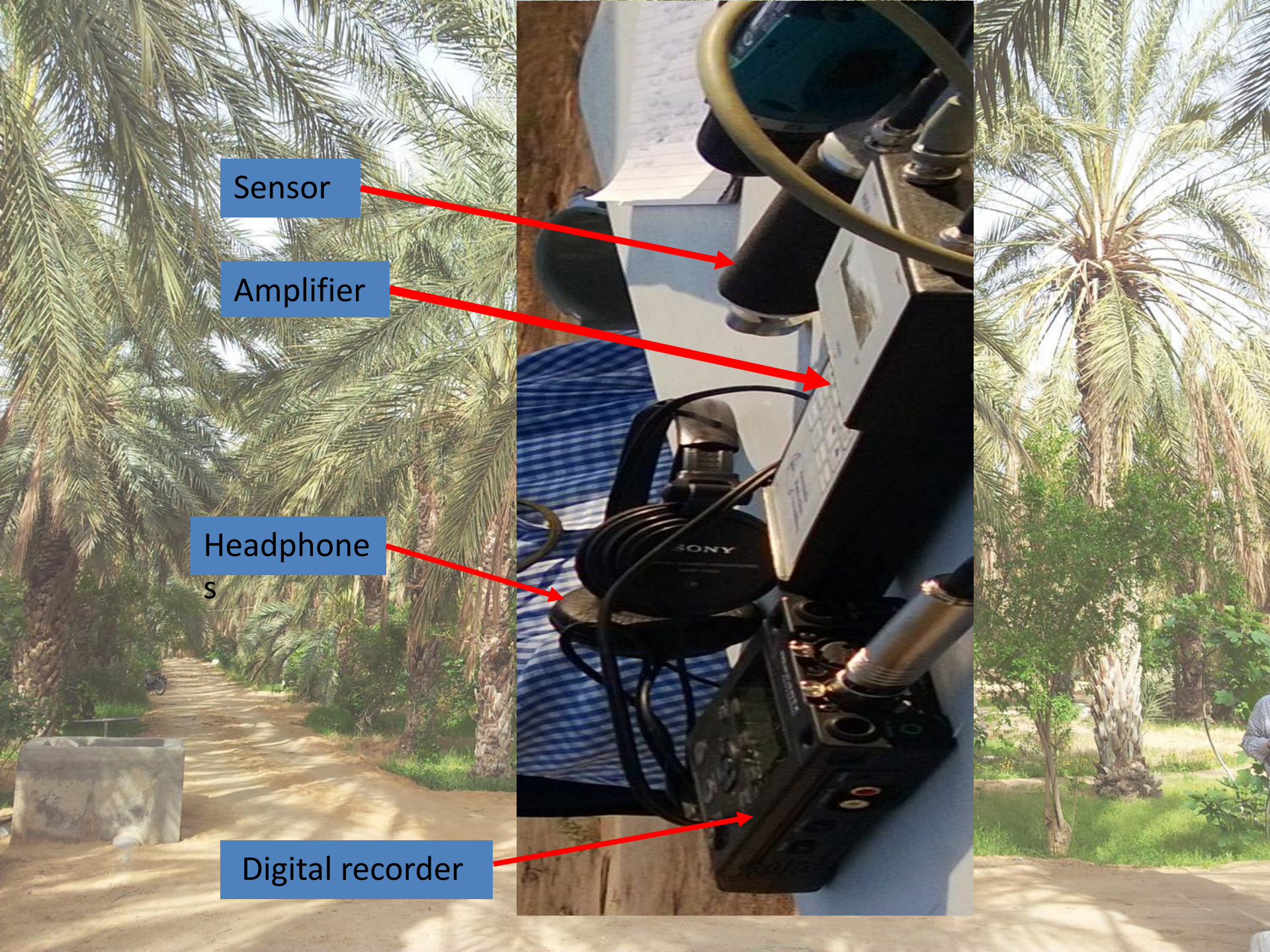
Southern Asia and Europe, Africa

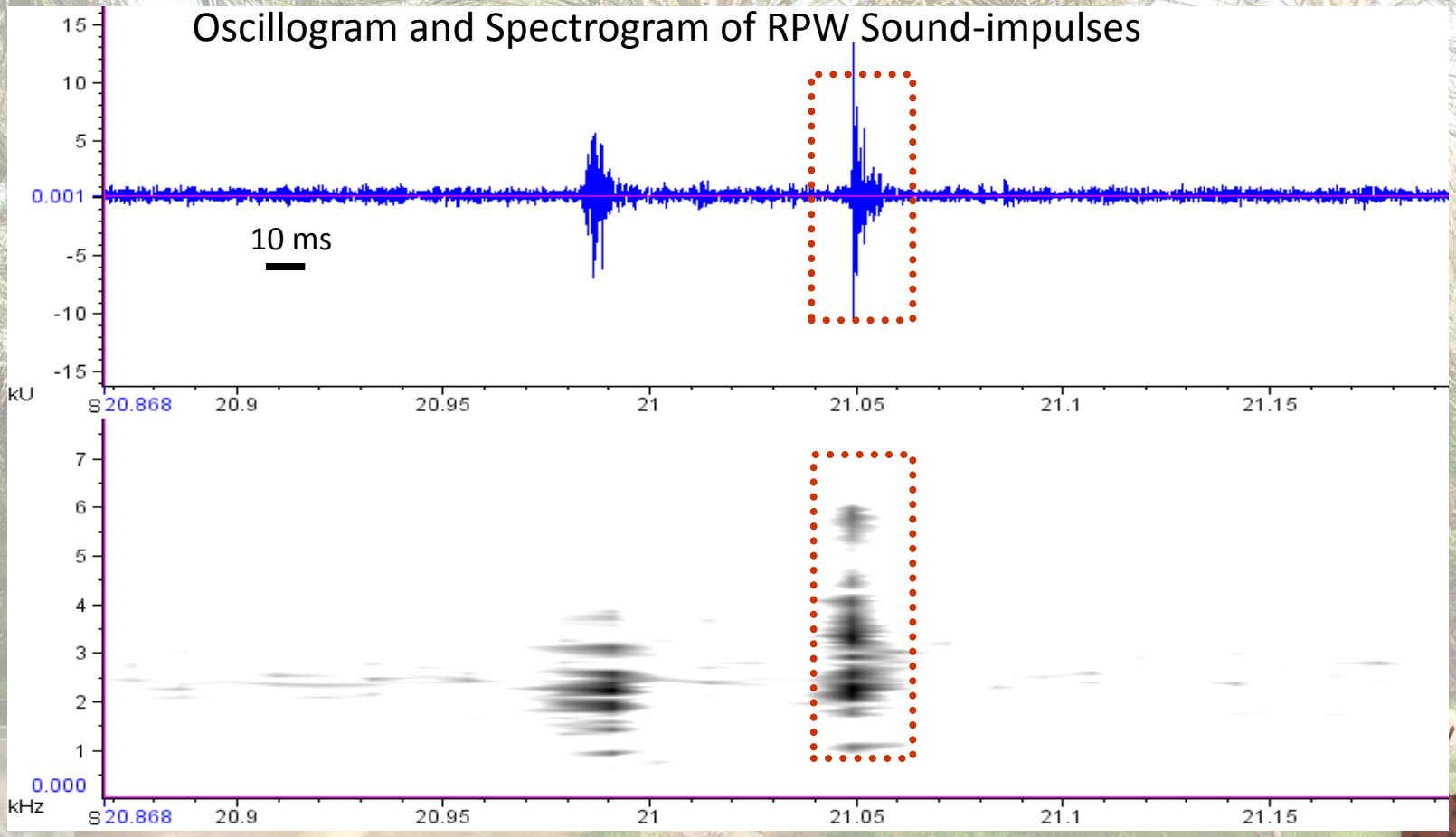
Caribbean

Komi Fiaboe

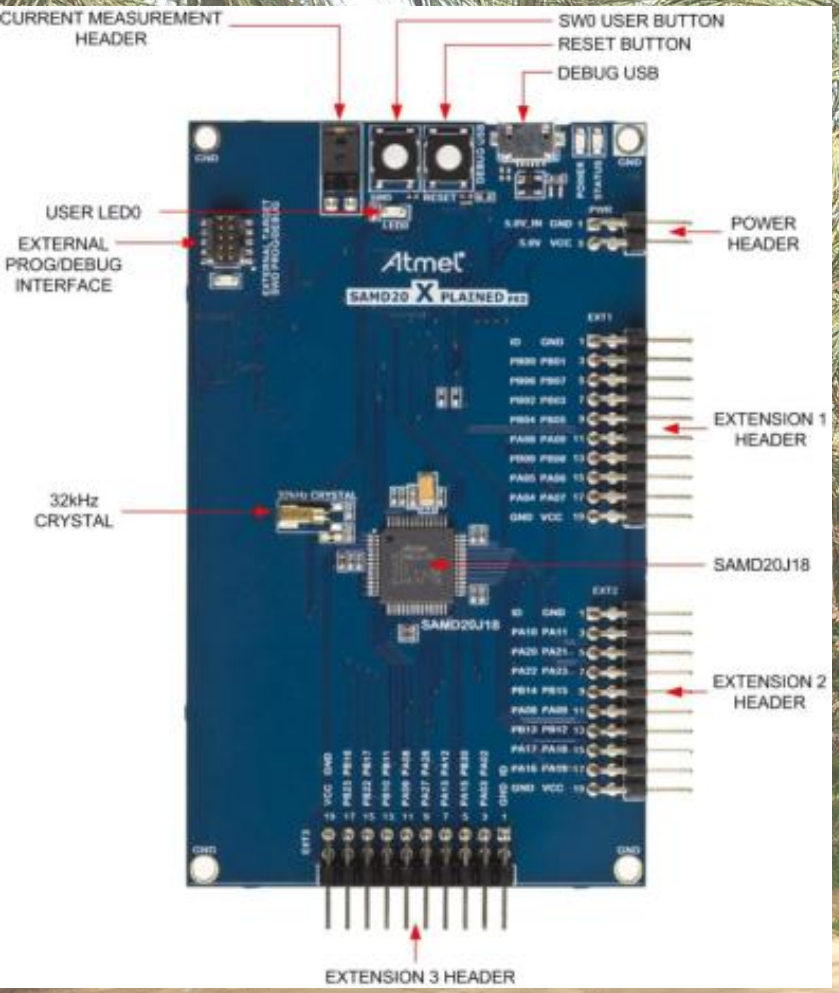
Early detection of adults and larvae is important for management

RPW life cycle: All stages except egg can be detected acoustically

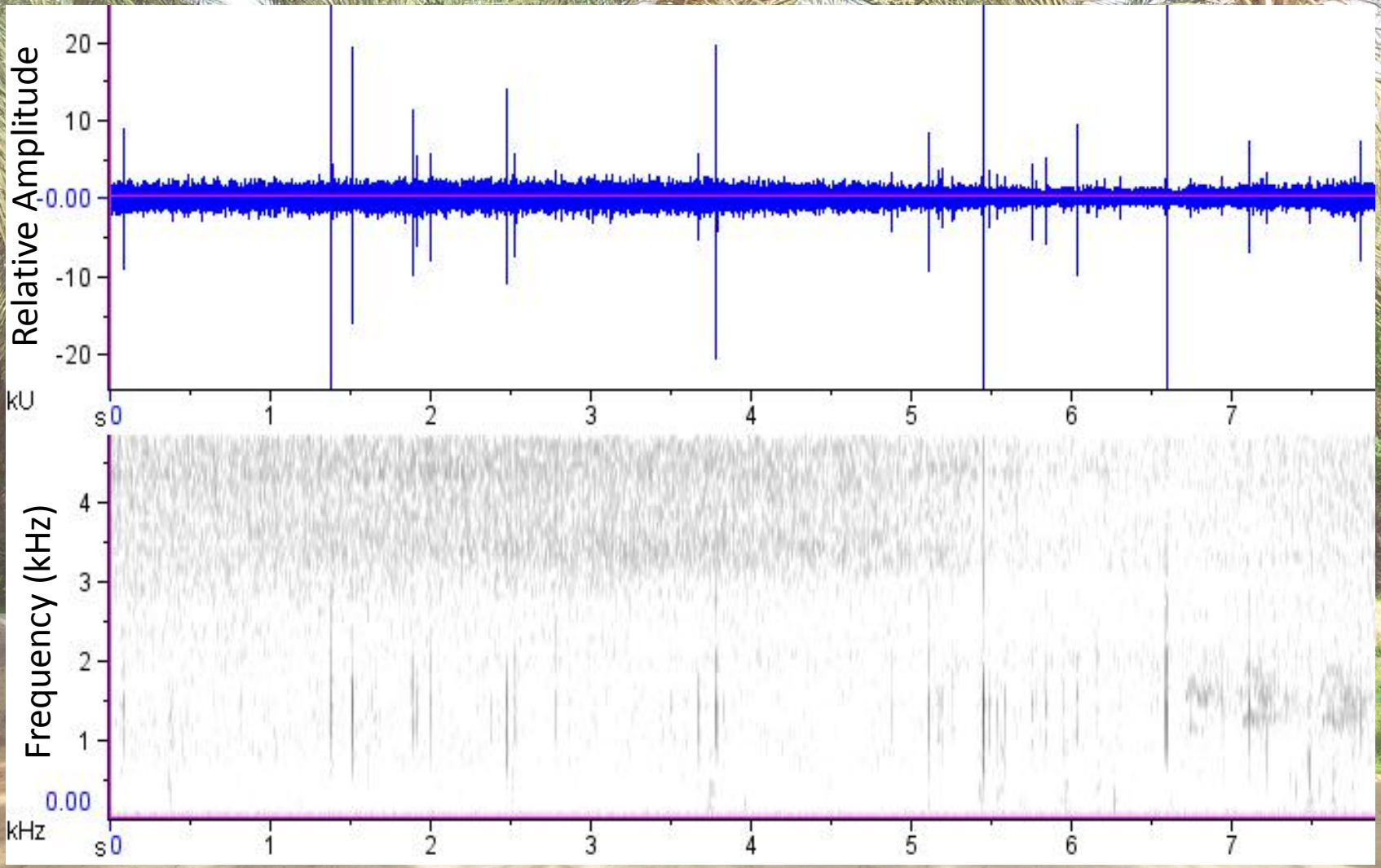

Sensor
Amplifier
Headphone
s
Digital recorder
SONY

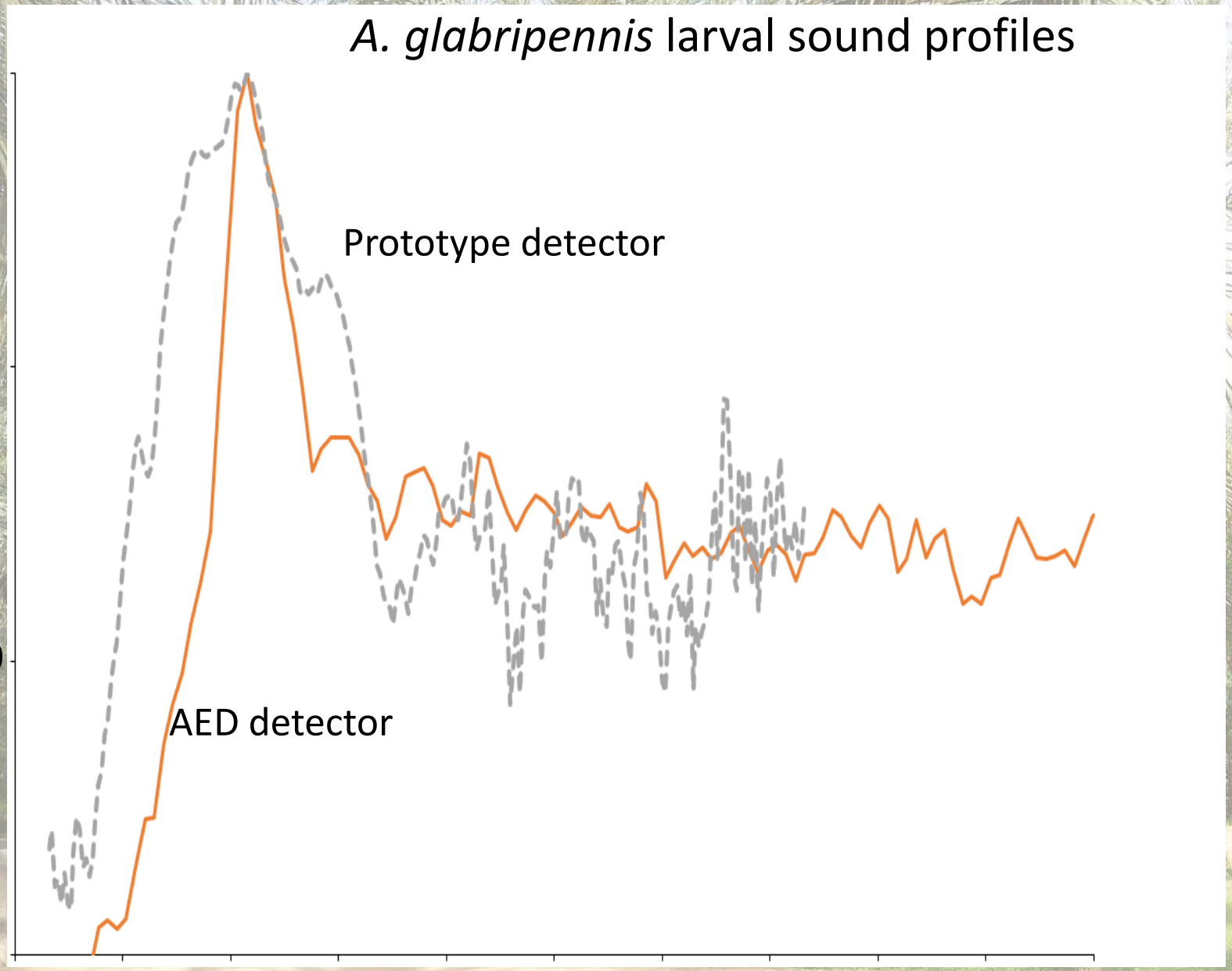

Oscillogram and Spectrogram of RPW Sound-impulses
Relative Amplitude
Frequency (kHz)
Time (s)
10 ms
15
10
5
0.001
-5
-10
-15
kU
S
20.868
20.9
20.95
21
21.05
21.1
21.15
7
6
5
4
3
2
1
0.000
kHz

Introduction of Onboard Signal Processing Capability



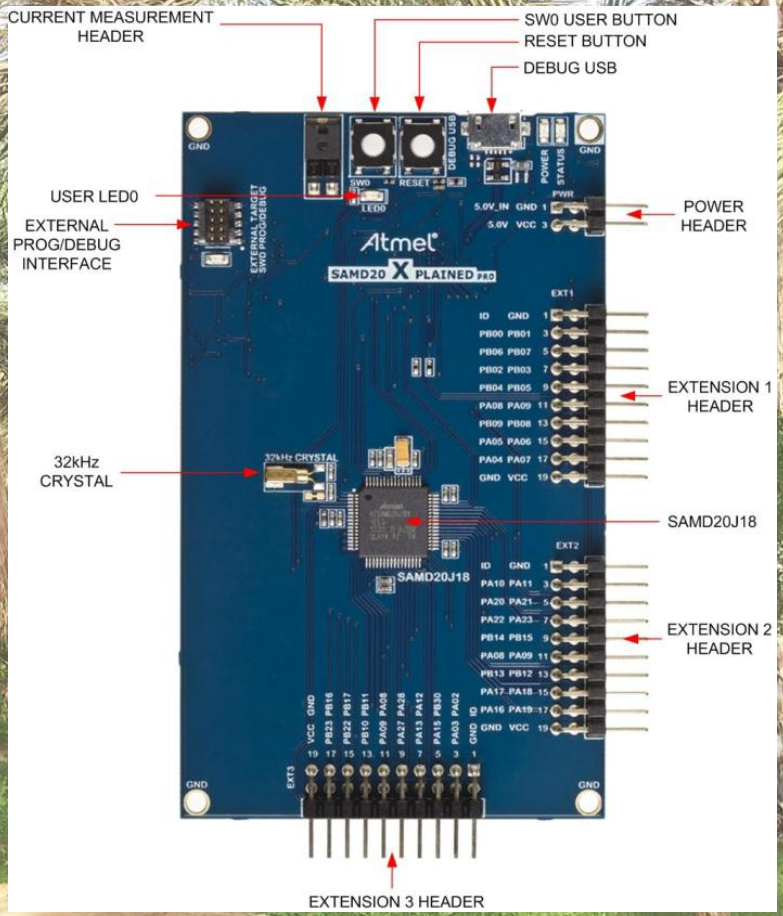
Example of *A. glabripennis* sounds collected with new microcontroller system sensing an electret microphone attached to red maple tree




A. glabripennis larval sound profiles
0
-10
-20
Relative amplitude (dB)
Prototype detector
AED detector
3
6
9
Frequency (kHz)

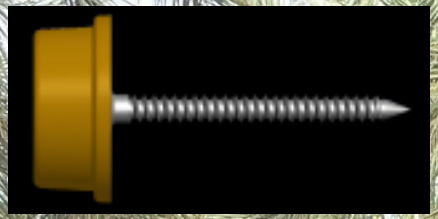
Now Implementing on Latest (SAMG55) Version of Atmel microcontroller

- Faster processing
- Less power usage
- More memory



Future Directions in Field Implementation

Similar Devices Advertised in 2017 by www.agrint.net



2015 (I Potamitis, Crete, Greece)
Automated pheromone E-trap for RPW
uses GPS and cell phones

2017 (I Potamitis, Crete, Greece)
Unmanned Aerial Vehicles to identify abnormal crowns
Of palm trees potentially infested with RPW
Also can be used with RPW E-traps

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