



# The Oasis Sofa: Application of Conservation Agriculture in Urban Vegetable Production

by D.I Edralin, L. Hok, K.  
Le, M. Williams, M. Reyes  
and et al.

Presented at the Third  
International Conservation  
Agriculture Conference,  
Hanoi, Vietnam, December  
10-14, 2012



# Thanks to my family



**Lorna**



**Micah, completed his Masters. But has a job sailing in Newport, Rhode Island. No girlfriend @ 27 years old. I want to be a granddad.**





**Zach, kissing an ancient smiling face  
in Angkor Wat, Cambodia**



**2012**  
**Just turned 13**



**2011**



# Angkor Wat, 12<sup>th</sup> century





# Angkor Wat Angeline Jolie's Tombraider





**Fourth International Conservation Agriculture  
Conference in Southeast Asia, University of  
Battambang, Battambang, Cambodia.  
December 9-13, 2013.**





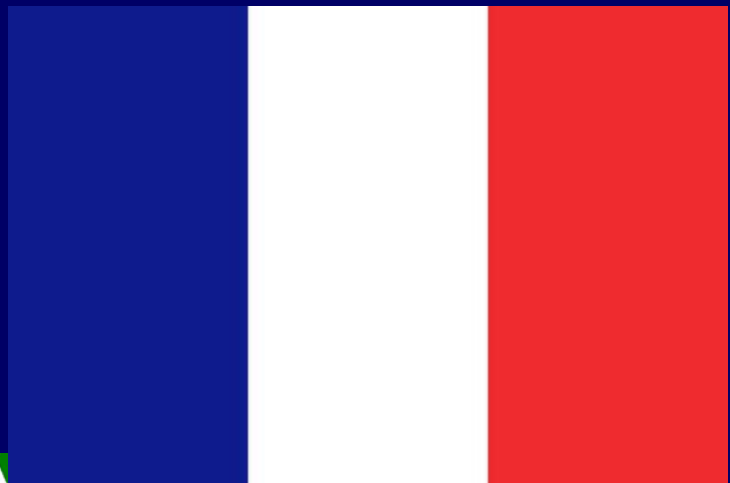
# Funding for Study







# Strong Partnership of Countries with Flags of Red, White and Blue







# Tutor in Conservation Agriculture



- Stephane 'macho' Boulakia - CIRAD Scientist, host country coordinator, Cambodia





# Magnificent Three Ph.D. Graduate Students



**Michael Williams**  
**USA**



**Lyda Hok**  
**Cambodia**



**Don Immanuel Edralin**  
**Philippines**





# With Three Ph.D. students from Vietnam:



**Dat and Kieu**  
husband and wife



**Hai**





# Outline

**1. Background**

**2. Objectives**

**3. Results**

- **Research**
- **Instruction**
- **Extension**

**4. Conclusions**





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# White House



IMPROVE YOUR NEIGHBORHOOD  
PLANT A GARDEN







# **Lawn**

**our drug addicted  
carpet**



# Lawn Struggling with Addiction





# Change to a Natuiculture System





# Natuculture

## New 'Term'





# Natuculture

Pronounced as:

Nā-chew-culture





# Natuculture

Any human made  
system that mimics  
nature in human  
disturbed landscapes





# Example: Lawn



Human  
Disturbed  
Landscape





# Build Oasis Sofa







# What is an Oasis Sofa?





# Conservation Agriculture Vegetable Beds 6' by 3' in size





# Sofa

Size is 6 ft by 3 ft





# Symbolical not to be a couch potato

## Obesity Problem



<http://narcoosseefl.com/2010/12/key-to-obesity/>





# Food desert is a problem in urban communities





# What is a Food Desert?





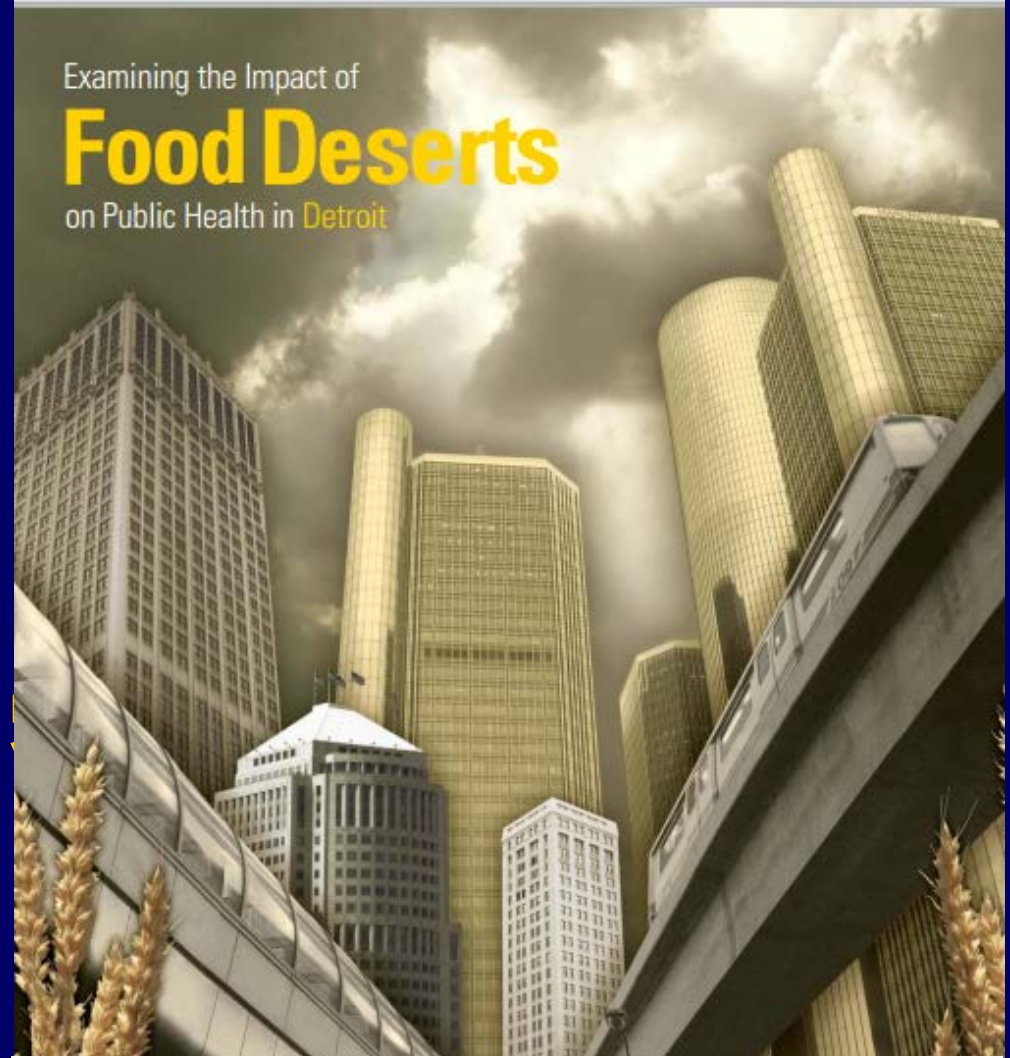
# Places where you cannot buy Nutritious Food





# Detroit, Michigan USA

Examining the Impact of  
**Food Deserts**  
on Public Health in **Detroit**



<http://www.yaleruddcenter.org/resources/upload/docs/what/policy/DetroitFoodDesertReport.pdf>







# In a desert you need an: Oasis





# Oasis of nutritious vegetables





# Oasis Sofa

## Conservation

Agriculture Vegetable

Beds 6' by 3' in size





**Oasis Sofa is urban  
semantics for  
conservation  
agriculture because to  
kids agriculture or  
gardening is not cool**





# Oasis Sofa applies three principles of Conservation Agriculture





# McD





# McD

Minimal soil disturbance

No tillage





# Minimum soil disturbance no-tillage







# McD

# Continuous mulch





# Continuous mulch





# McD

## Diverse species





# Diverse species





# McD

Minimal soil disturbance

Continuous mulch

Diverse species





# McD





# What does CA copy?

from L. Seguy & S. Bouzinac,  
CIRAD, 1996

Conservation Agriculture is the *forest* model copied at field scale





# Natuculture

Any human made  
system that mimics  
nature in human  
disturbed landscapes







# Therefore 'Oasis Sofa' is a natuculture system





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# Objectives:

To show the benefits of Oasis sofas in providing nutritious pesticide free healthy food and for urban CA research, instruction and extension.





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# Research





# Methodology



**Turf lawn, Sockwell Hall**



**Students transporting & leveling soil**



**Students making oasis sofa's**



**Urban CA, Fall 2011**



**Urban CA, Summer 2012**





# Treatments:

- Oasis Sofa summer cover crop
- Oasis Sofa winter cover crop
- No tillage no cover crop  
vegetable all year
- Tilled system and vegetable all  
year

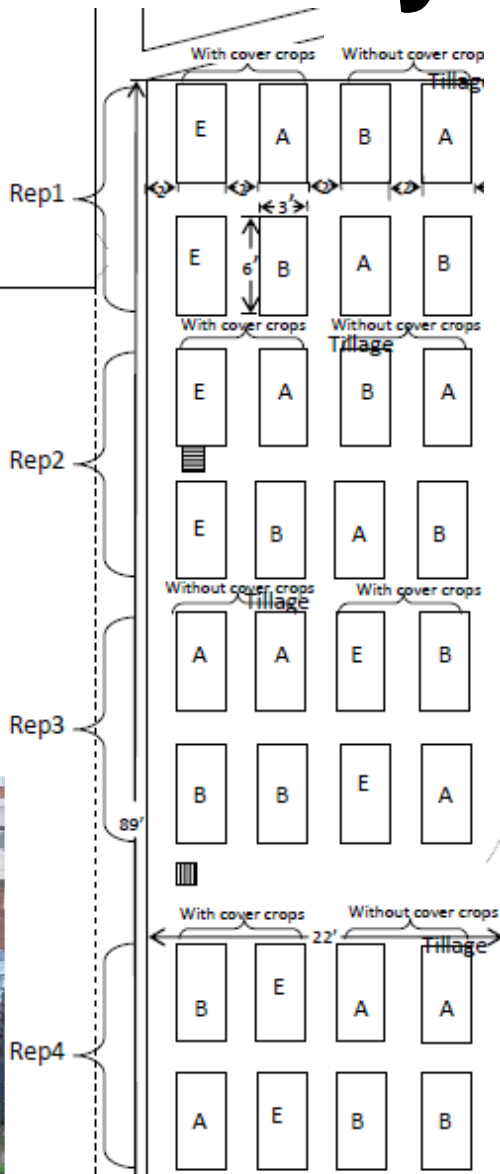




# Experimental layout

Oasis Sofa's  
Fall 2012  
Planting

Sockwell  
Hall



## Legend:

**A=lettuce**

12 plants per oasis sofa

Distance between Rows:

Distance per plant:

**B = Collard greens**

12 plants per oasis sofa

Distance between Rows:

Distance per plant:

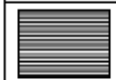
**E = Clovers Cover crop**

Mixture of white, red and crimson

**Clovers in the alleys will be allowed to regrow**



## Legend:



Facilities wooden box



Lamp post



Small gate for the facilities





# Aerial view



Aerial view from google map



# To see is to believe





# Fall 2011



**Collard greens**  
*Brassica oleracea* (Acephala group)



**Kale**  
*Brassica oleracea* (Acephala group)



**Broccoli**  
*Brasica oleracea* var. *italica*



**Lettuce**  
*Lactuca sativa*



# Sockwell Summer 2012 Vegetable Oasis

No cover  
crops

With mulch  
from previous  
cover crops



vegetables





# Summer 2012 vegetables



Okra AKA “Lady’s fingers”  
*Abelmoschus esculentus*



Cherry tomato  
*Solanum lycopersicum*



Celebrity tomato  
*Solanum lycopersicum*



Eggplant  
*Solanum melongena*



**Fall 2012**

**Photographs taken**

**December 10, 2012 Eastern  
Standard Time**

**Two months after  
transplanting**





# Collard greens: Tilled System





# Collard greens: No-Till System







# Collard Greens: Conservation Agriculture or Oasis Sofa System





# Lettuce: Tilled System





# Lettuce: No-Till System



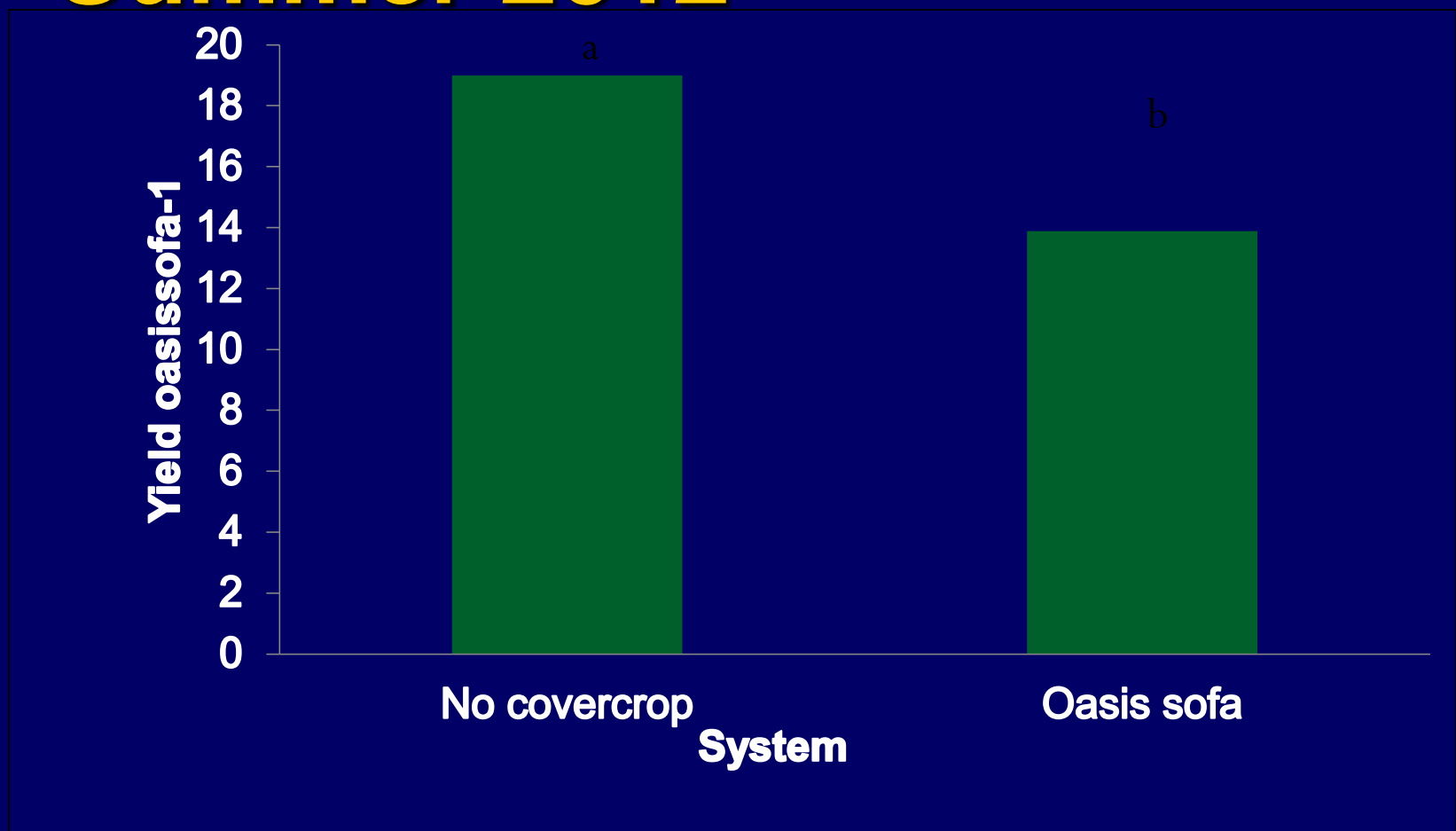


# Lettuce: Conservation Agriculture or Oasis Sofa System



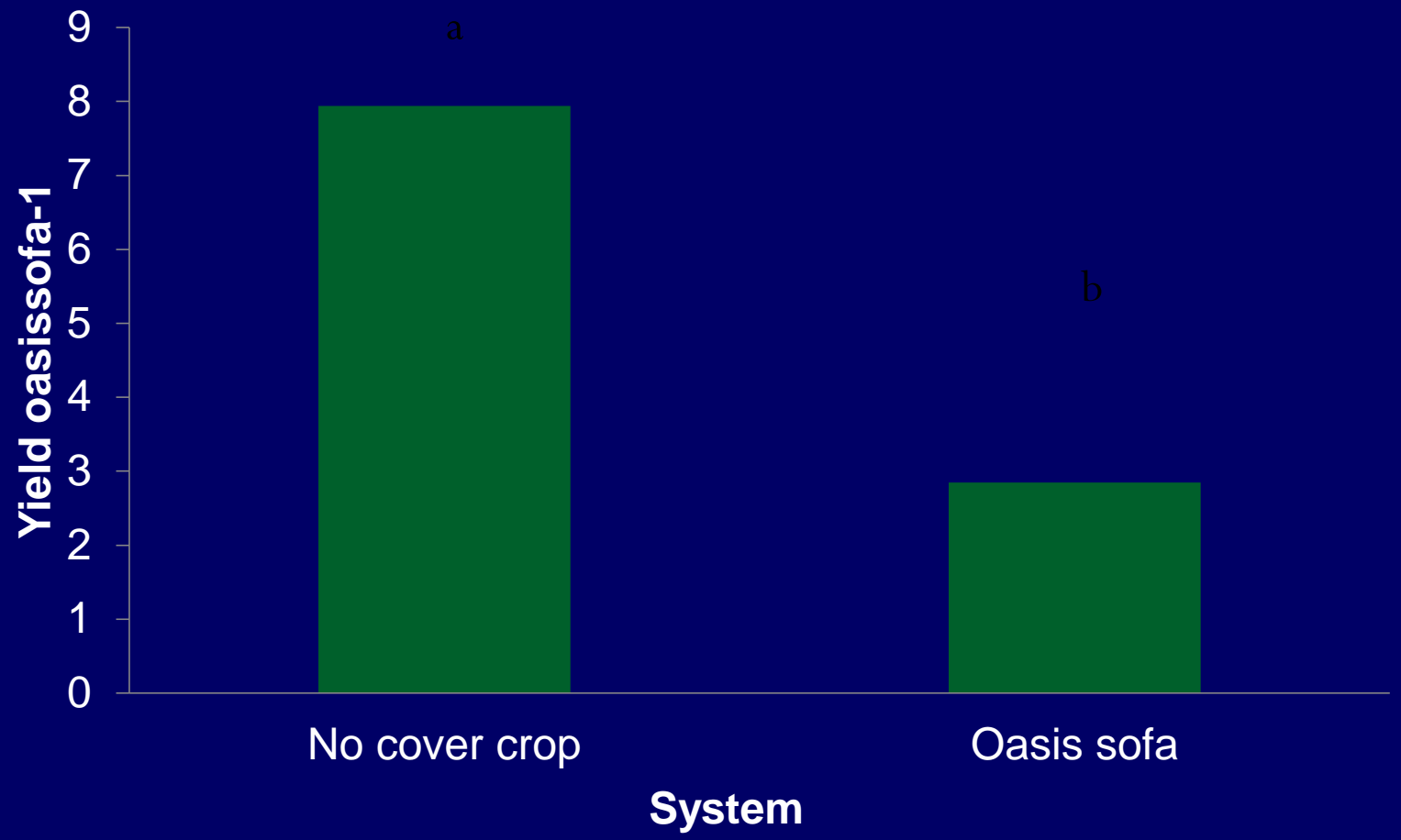


# Cherry tomato – Total Yield Summer 2012



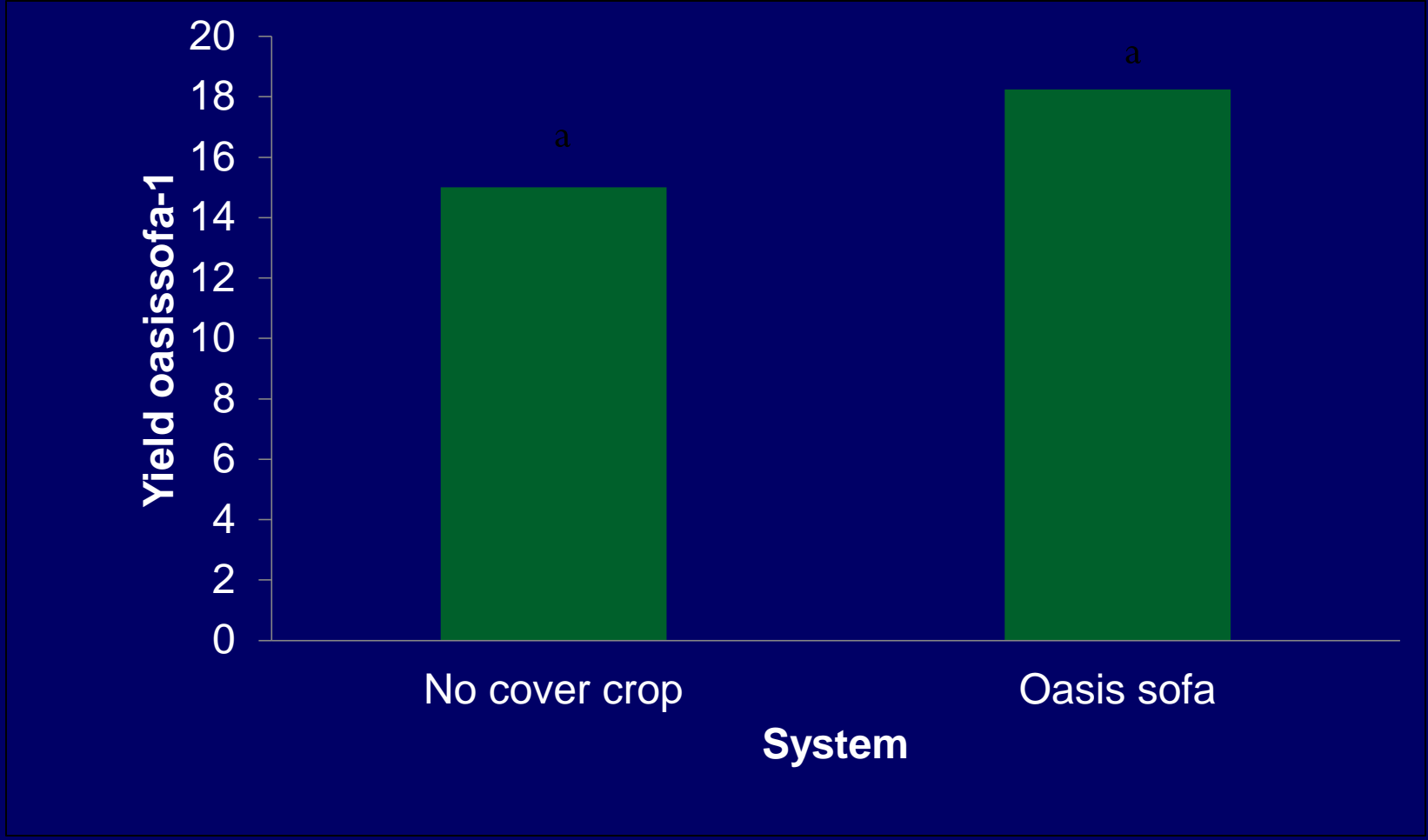


# Okra – Total Yield Summer 2012



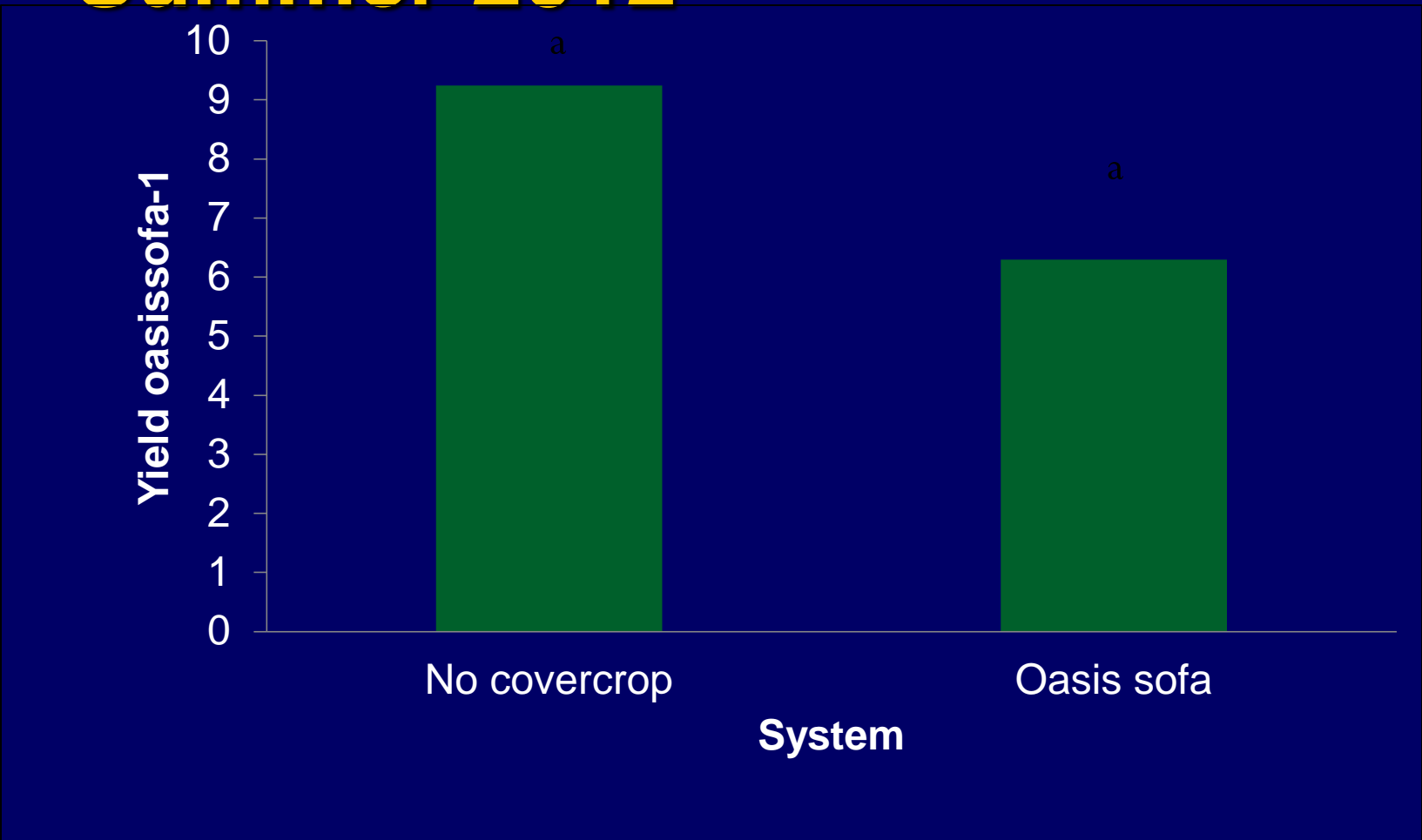


# Celebrity tomato – Total Yield Summer 2012





# Eggplant – Total Yield Summer 2012







# Number of fruits of vegetables Summer 2012

CHERRY TOMATO	No. of fruits
No cover crop	2928 <sup>a</sup>
Oasis sofa	2098 <sup>b</sup>

OKRA	No. of fruits
No cover crop	403 <sup>a</sup>
Oasis sofa	186 <sup>a</sup>





# Number of fruits of vegetables Summer 2012

CELEBRITY TOMATO	No. of fruits
No cover crop	98 <sup>a</sup>
Oasis sofa	121 <sup>a</sup>

EGGPLANT	No. of fruits
No cover crop	44 <sup>a</sup>
Oasis sofa	28 <sup>a</sup>

means having same letters are not significantly different at 5% level of significance as indicated by Duncan's multiple range test.





# Fall cover crop







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# Teaching





# Yield Measurements





# Eggplant







# Okra





# Biomass Measurements

Undergraduate student as I speak is  
teaching at Smith High School





# Sunhemp covercrop





Teach and partner with  
High Schools on:

# Soil Quality Monitoring





# Soil quality testing





# Soil Test kit





# pH





# Infiltration test







# Cornell Sprinkler Infiltrometer Reading by Students





# Bulk density test



# Soil Nitrate Test ( $\text{NO}_3^-$ )





# Soil Respiration





# Soil Respiration test







# Earthworms





# Slake test







# Aggregate stability





# Data gathering with Time Domain Reflectometer at the Oasis Sofa's





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# Extension





**Installation in Pre-K to  
Four High School  
Campuses Oasis Sofa  
(In High Schools they  
are replicated studies)**





# Pre K: NCA&T Child Development Lab





# New McDonald had a farm





“New McDonald had a Farm”

# Lyrics:

## “New McDonald had a Farm”

### Minimum soil disturbance

New MacDonald had a farm, EE-I-EE-I-O  
And on that farm s/he does not till, EE-I-EE-I-O  
With a no till here and a no till there  
Here a No, there a till, everywhere a No Till  
New MacDonald had a farm, EE-I-EE-I-O.







“New McDonald had a Farm”

# Lyrics:

## “New McDonald had a Farm”

### Continuous Mulch

New MacDonald had a farm, EE-I-EE-I-O  
And on that farm s/he had a mulch, EE-I-EE-I-O  
With a mulch mulch here and a mulch mulch there  
Here a mulch, there a mulch, everywhere a mulch mulch  
New MacDonald had a farm, EE-I-EE-I-O





“New McDonald had a Farm”

# Lyrics:

## “New McDonald had a Farm”

### Diverse species

New MacDonald had a farm, EE-I-EE-I-O  
 And on that farm it was diverse, EE-I-EE-I-O  
 With a corn rice here and a tree tree there  
 Here a green, there a bean, everywhere manure green  
 New MacDonald had a farm, EE-I-EE-I-O





# General Greene Elementary





# Neal Middle School





# Southeast Guilford High School





# Southern High School





# Smith High School





# Dudley High School







# First Natuculture and Oasis Sofa Conference at North Carolina A&T State University November 14, 2013.





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# Conservation Agriculture or Oasis Sofa System can be applied in Urban homes and school campuses





And we will once again show to the everyone specially the youth that:





# Agriculture

Science, Technology,  
Engineering and Math  
of Human Survival





# Questions

