



Oasissofas: Growing Food While Mimicking Forests

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Introduction

Water quality in urban areas can be enhanced by biomimicry. In this study, we mimicked the forest by growing vegetables in 6' x 3' beds called oasissofas copying a 'forest ecosystem' of: continuous mulch; minimum soil disturbance – no tillage; and spatial and rotational species diversification.



A highly fertilized, compacted and herbicide applied monoculture lawn at the North Carolina Agricultural and Technical State University campus was converted into an experimental site to test if an oasissofa system is a better alternative in producing urban vegetables compared with conventional tilled systems. The site used a lot less artificial chemicals than when it was in grass hence water quality from runoff is improved.

Oasissofas mimics forest because like forest we do not till, there is continuous soil cover from mulch, and have diverse species following the principles of conservation agriculture



Taken from Edralin et al., 2012. Conservation Agriculture in Urban Deserts. Presented as poster in SSSA meeting, Cincinnati Ohio.



Turf lawn, Sockwell Hall, 2011



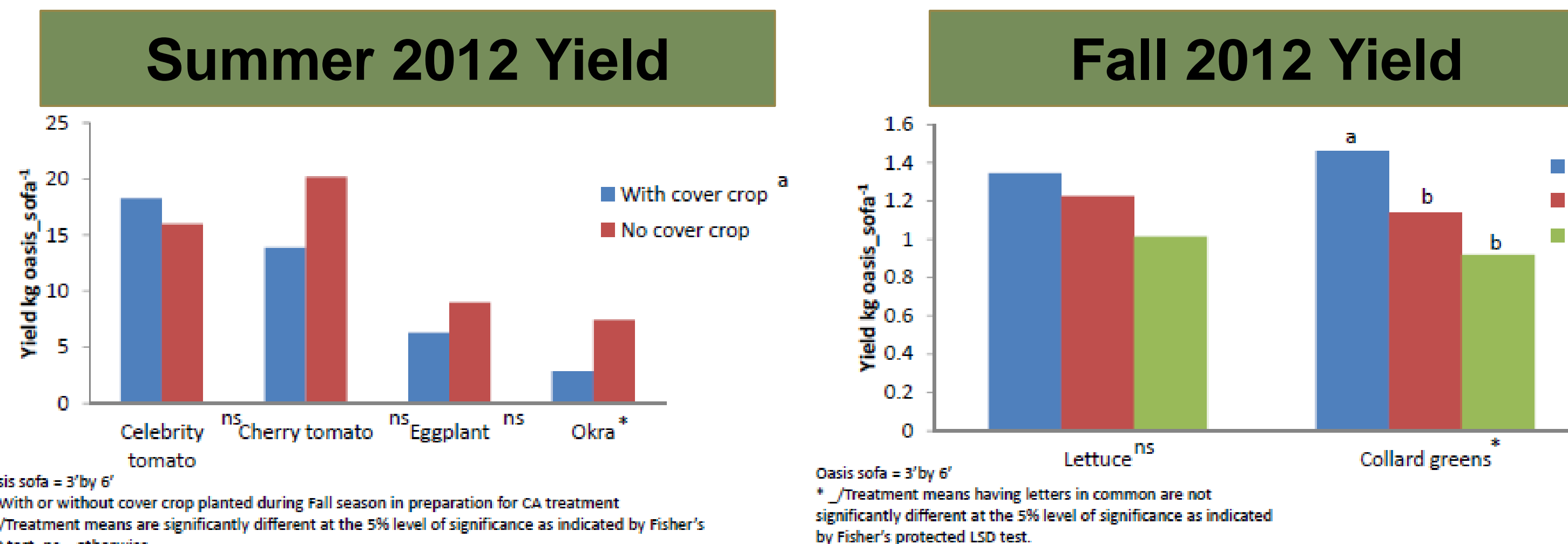
Oasissofa Study, Fall 2011



Oasissofa Study: summer 2012 (left) and summer 2013 (right)

Results and Discussion

Yield



Treatments	Summer 2013 Yield, Kg/sofa
-----Tomato-----	
Oasissofa or CA	15.72 ^a
No-till	11.15 ^b
Tilled	10.78 ^b
-----Sweet Pepper-----	
Oasissofa or CA	10.82
No-till	9.78
Tilled	12.38

*Means of vegetables having letters in common are not significantly different at 5% level of significance as indicated by Fisher's protected LSD test.

Yield of vegetables in Summer 2012 were not influenced by covercrops except for okra. Okra do not produce a dense cover and this might have provided a good environment for weed growth thus it competed with okra growth and affected yield. Eggplant and tomatoes provided good canopy.

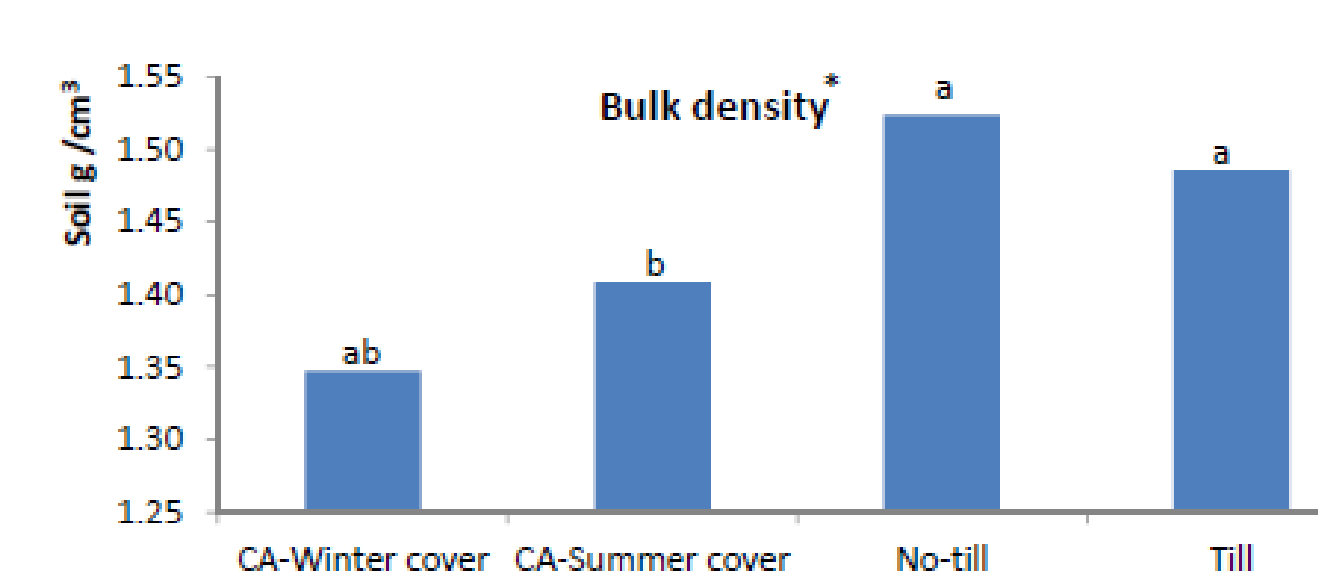
Fall 2012 lettuce did not show differences in yield as a result of the treatments but collards showed better yield with CA. Collards being harvested late during early winter might have benefited from the residues remaining on the soil surface. The mulch on top of the soil may have provided insulation during snow. In tilled and no-till systems where they did not have soil cover their yields did not differ.

CA Yield for 2013 shows promising results for tomatoes with 4.6 kg and 4.9 kg difference in yield compared to no-till and tilled systems, respectively. With sweet pepper, however, the yields were the same with about 11 kg per sofa.

Soil Quality

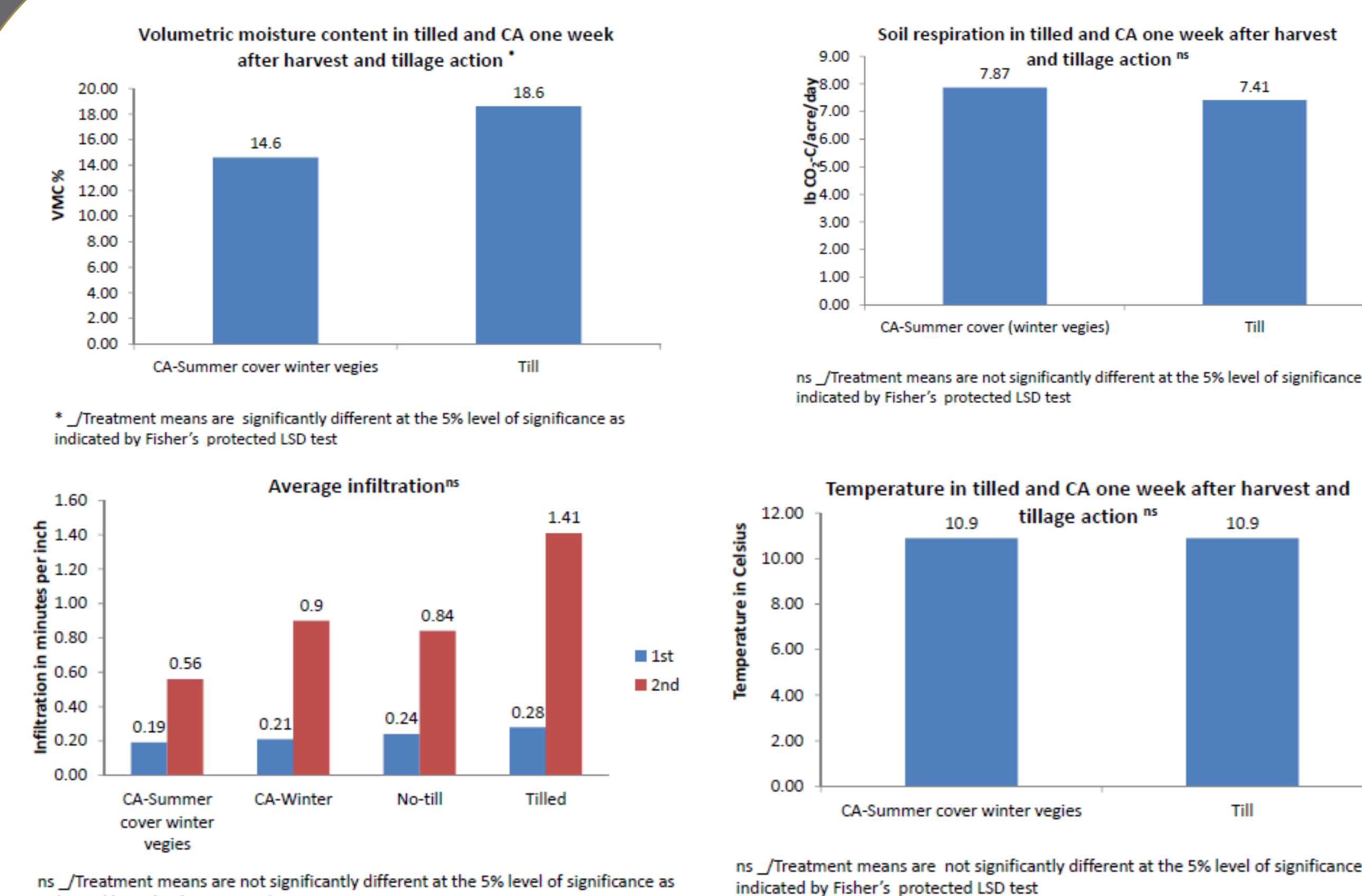
Data gathered Spring 2012

Soil characteristic	Value
Soil type	Loamy sand
pH	8.5
EC	0.24 dS/m
Soil water content (NRCS Method)	0.24 g/g
Volumetric water content (TDR)	35.51 %



*_/Treatment means are significantly different at the 5% level of significance as indicated by Fisher's protected LSD test.

No-till and Tilled sofas's on the average have bulk density of 1.50 g/cm³ and is different from that of winter veges by 0.158 g/cm³. Clover plots were not different from the rest.

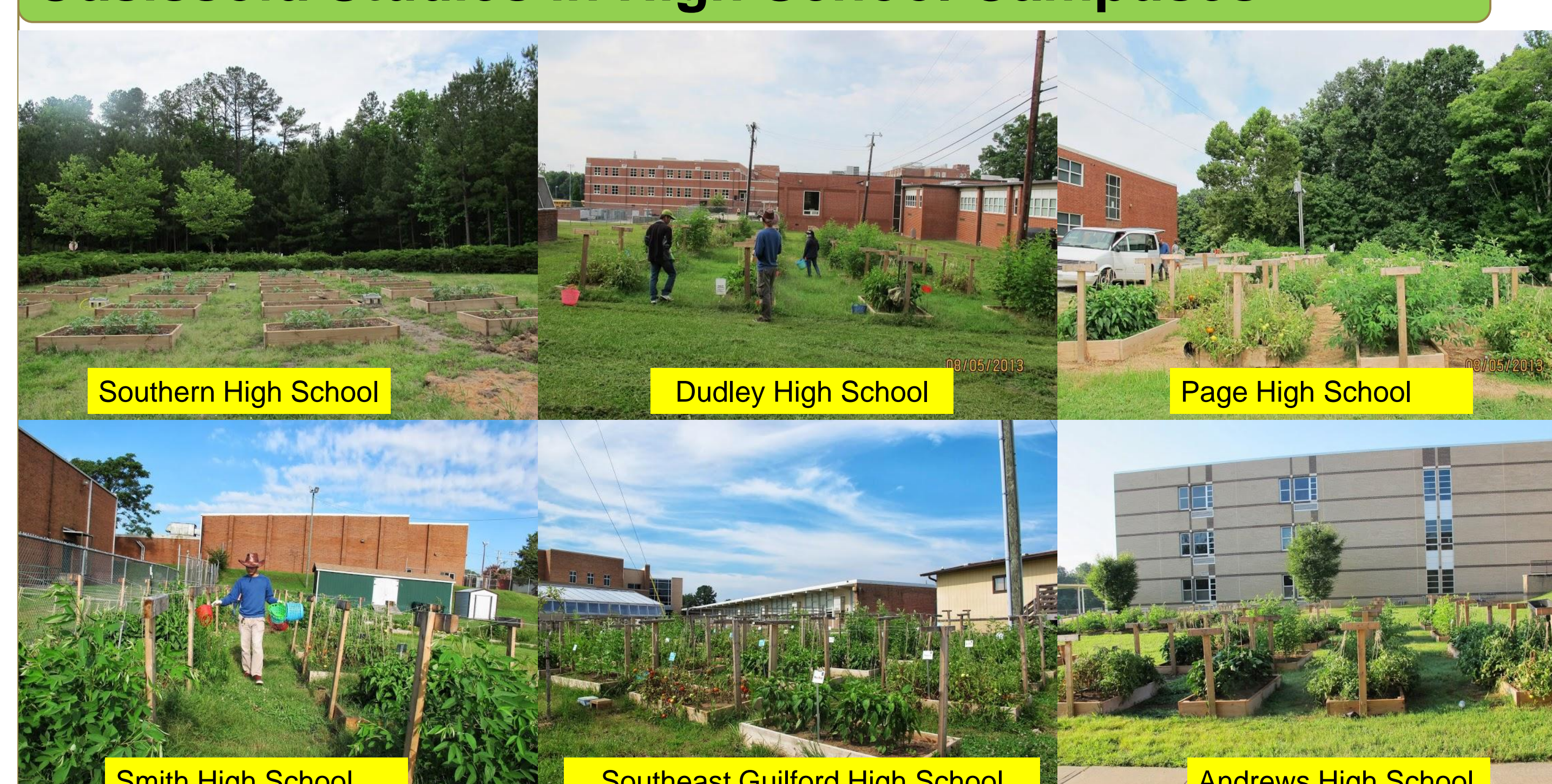


Soil bulk density of CA Summer – Using Sun hemp as cover crop during summer time showed less compaction than tilled and no-till soils. The CA Winter- using clovers as cover crop did not differ significantly from tilled and no-till systems.

Volumetric moisture content showed to be higher in tilled system than CA, 1 week after cultivation. Soil respiration and temperature did not show significant differences during the time of sampling.

Average infiltration rates did not show significant differences. However, it was observed that in tilled systems the water is murky and takes longer waiting time for water to infiltrate especially during the second wave of infiltration test.

Oasissofa Studies in High School Campuses



Oasissofa studies are being implemented in six high schools as an outdoor laboratory in Greensboro and Durham, North Carolina. Teachers use oasissofa studies for teaching science courses. Students and faculty liked the growing of vegetables in schools which reconnect campus communities to Agriculture: the Science, Technology, Engineering and Math of human survival. Challenges faced are maintenance activities especially during summer time and long holidays when students are having their vacations.



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