

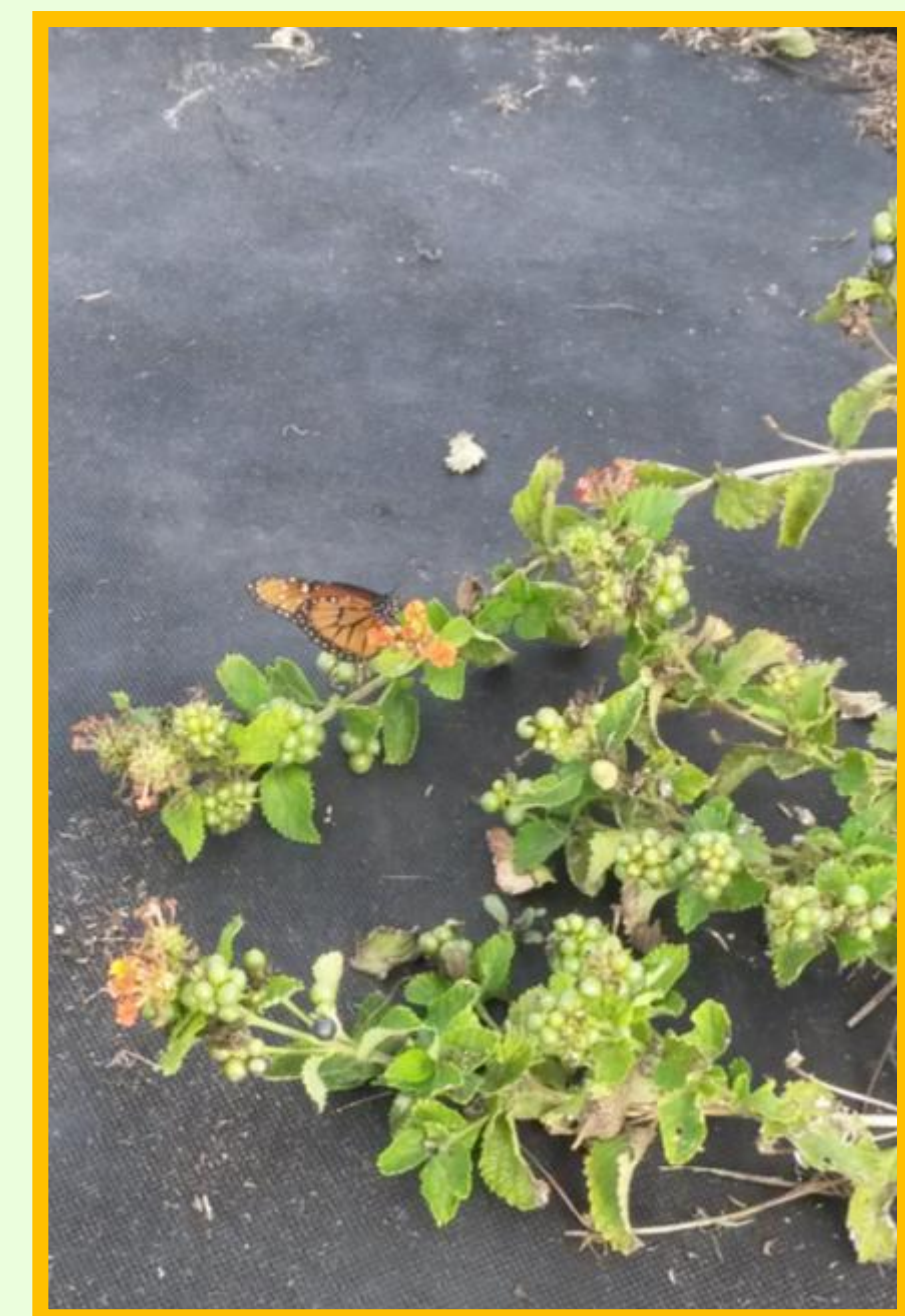
A comparison of flower visitors to Texas native and exotic ornamentals

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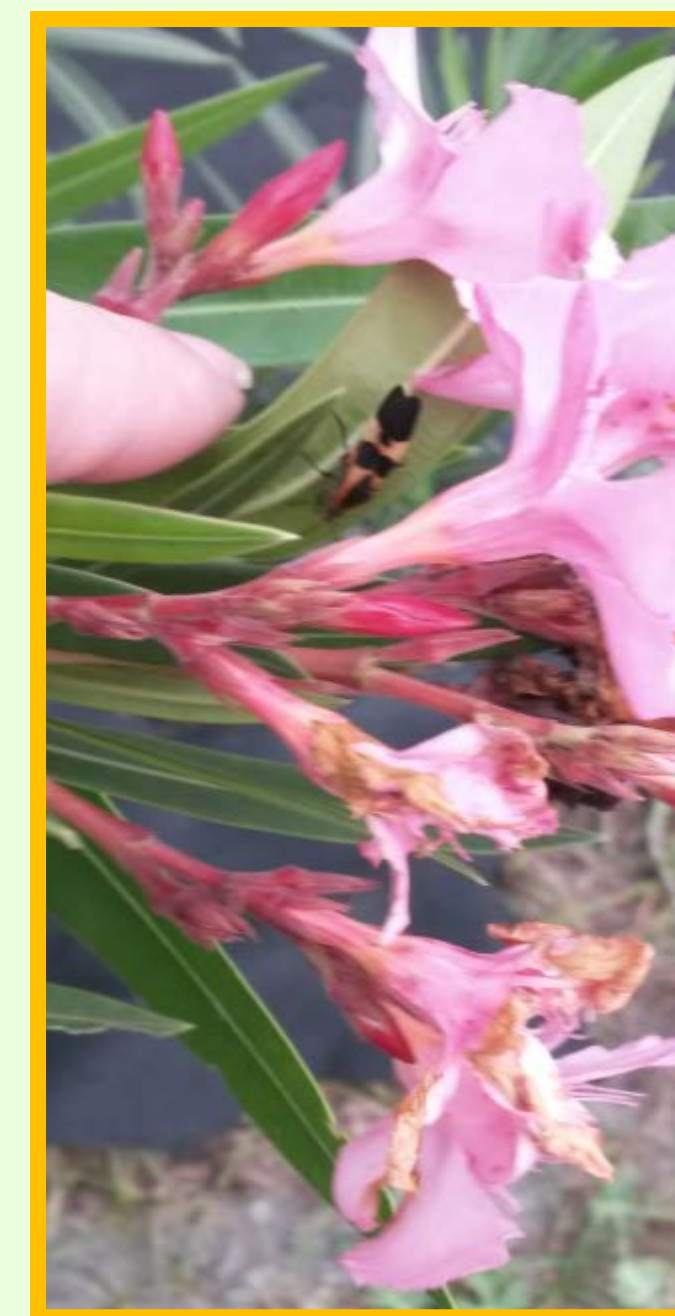
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Abstract

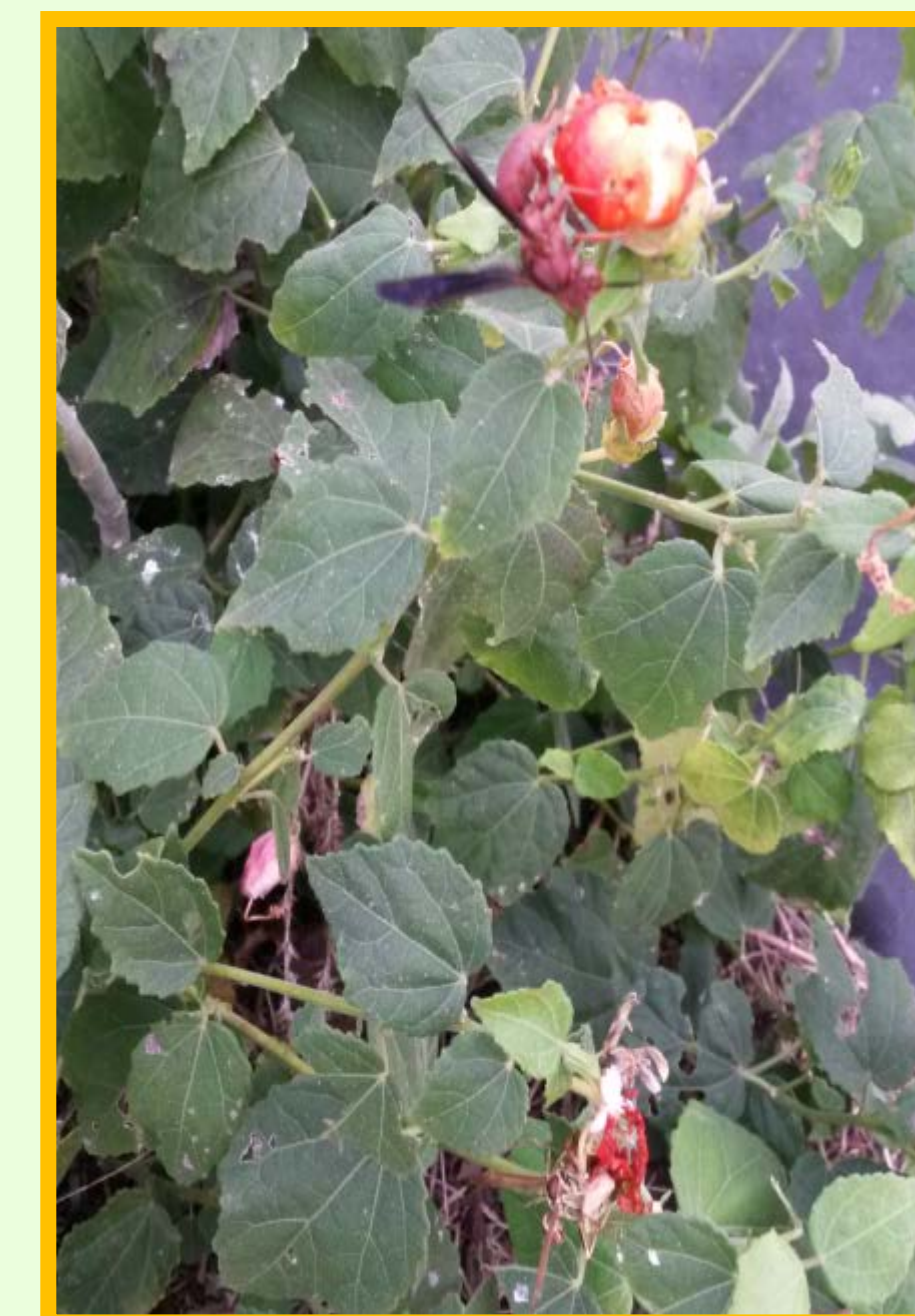
Exotic plants often have lower parasite loads and other measures of symbiont diversity than co-occurring native plants¹. Ornamentals can be essential nectar sources for pollinators in urban areas and since most plantings are often of non-native varieties, we might expect lower overall accompanying species richness than if only natives were planted. We tested this expectation for our area in a small field trial. We planted together native and exotic plants in a Latin square design and observed flower visitations by insects among some commonly grown local ornamentals. Plants included the natives: Esperanza, Texas Sage, Texas lantana, Turk's Cap, Cenizo, and the exotics: Spindle tree, Maui Ixora, Oleander, Texas Waxleaf Privet and Indian Hawthorn. As anticipated, we found lower insect diversity and abundances on the exotic plants than on the natives. Native ornamentals generally had larger, more abundant, frequent and consistent displays of flowers over the course of the study. This observed set of flowering patterns offered much higher levels of temporal and spatial apparencies that likely led to the observed greater biodiversity on the planted native plants. Comparisons of the insect diversity on these plants with data collected on non-target vegetation in and around these plots, as well as elsewhere in the area suggested the following. For our area in general, cultivation of native ornamentals can extend and enrich nectar sources over the course of the year, providing insect pollinators with stable alternative nutritional resources within and outside the typical seasons provided by self-sustaining populations of plants.



Texas Lantana: Visited by a Queen Butterfly



Oleander with Milkweed bug



Turks' Cap with *Polistes exclamans* and *Polistes cf. carolinensis*.

Observations on Insect Visitations

We monitored insects bimonthly from July 2016 to January 2017. Visual sampling was sufficient for all taxa except for some bees^{4,5} for which some we needed to collect. All taxa were identified at least to genus. Lower-lying non-cultivated herbs were swept for insect detection.

Flowering

Plant flowering was scored by plant during a sampling period with respect to 1) presence and 2) number and quality of flowers. Unfortunately, of the five exotic plant taxa, only Oleander and Ixora flowered during the observation periods. This was a result of poor establishment of the others. Insect observations were discontinued during January 2017 due to a debilitating freeze.

Results

We found 34 species of butterflies at the site, of which only four were found on the exotics and 3 only on non-cultivated herbs in the site (Table 1a). Only honeybees were found on exotics (Ixora), while 12 genera of bees were found on the native ornamentals, mostly as nectar feeders on Esperanza (Table 1b). The highest diversity of insects were found in November and December when flowering of other local plants had terminated.



Esperanza Visited by a Sickled wing Skipper



Ixora with whiteflies

Table 1a	Native				Field herbs		Exotics	
	E	TC	L	C	S	O	I	
Brazilian Skipper	1							
White-striped Longtail	1							
White-patched Skipper					1			
Orange Skipperling	1	1						
Southern Skipperling	1	1						
Funereal Duskywing					1			
Turk's-cap White-Skipper	1	1						
Eufala Skipper	1	1						
Julia's Skipper					1			
White Checkered-Skipper	1	1						
Mazans Scallopwing	1							
Texas Powdered Skipper					1			
Western Pygmy-Blue					1			
Reakirt's Blue	1				1			
Ceraunus Blue	1							
Oak Hairstreak					1			
Gray Hairstreak	1				1			
Gulf Fritillary					1			
Goatweed Leafwing					1			
White Peacock					1			
Hackberry Emperor					1			
Bordered Patch					1			
Queen					1			
Variegated Fritillary					1			
Mexican Fritillary					1			
Common Buckeye					1			
American Snout					1			
Common Mestra					1			
Phaon Crescent					1			
Painted Lady					1			
Pipeline Swallowtail					1		1	
Great Southern White	1	1						
Orange Sulphur					1			
Lyside Sulphur	1	1			1			
Dainty Sulphur					1			
Checkered White					1			
Southern Dogface					1			
Metalmark					1			
Total	12	1	21	0	0	24	1	

Table 1b	Native				Field herbs		Exotics	
	E	TC	L	C	S	O	I	
<i>Apis mellifera</i>	1	1	1			1		
<i>Bombus pennsylvanicus</i>	1	1						
<i>Melissodes</i>	1							
<i>Exomalpsis</i>	1							
<i>Anthophora</i>	1							
<i>Xylocopa mexicanorum</i>	1							
<i>Xylocopa tabaniformis</i>	1							
<i>Centris</i>	1							
<i>Colletes</i>	1							
<i>Andrena</i>						1		
<i>Augochlora</i>						1		
<i>Augochlarella</i>						1		
<i>Agopostemon</i>	1	1			1			
<i>Lasioglossum</i>					1			
<i>Protoxaea</i>	1							
Total	11	4	1	1	1	6	0	

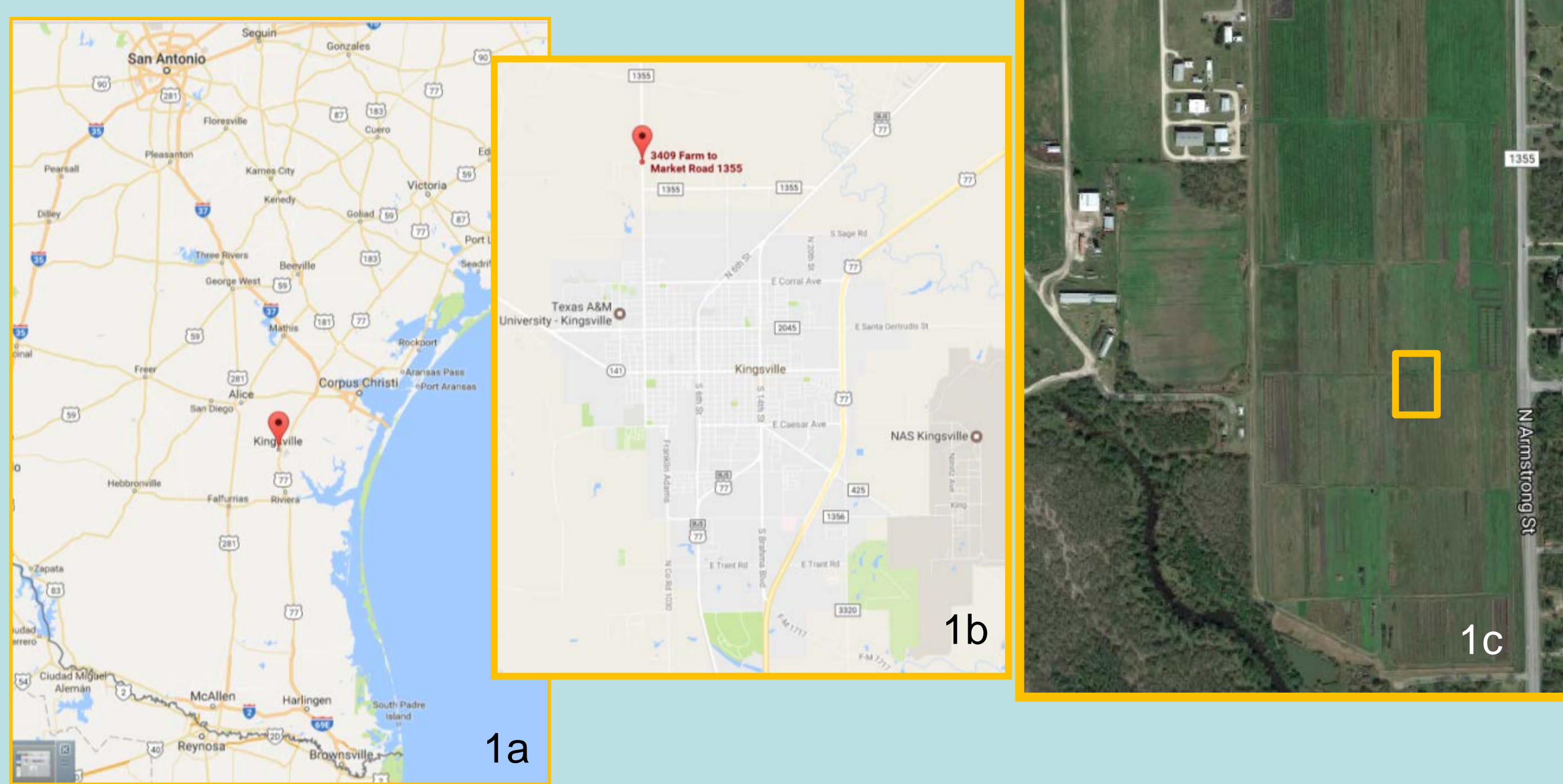
Abbreviations in Table 1
 E=Esperanza
 TC=Turk's Cap
 L=Lantana
 C=Cenizo
 S=Red Sage
 O=Oleander
 I=Ixora

Field herbs include among others:
Parthenium, Convolvus, Acacia, Rhychosia, Solanum, Amaranthus, Chamaesaracha, Croton, Chamaesyce

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Figure 1. Field plot location, a) in South Texas, b) within Kleberg County and c) at site



Plants and Site

Our ~0.2ha plot was located in the Coastal Bend Gulf Coast Prairies Vegetation Ecoregion (Figure 1) in Kleberg Co. at the E. "Kika" de la Garza PMC facility. Plantings were postponed until late spring of 2016 because of rains. Plants were set out in a Latin-square design to account for spatial patterns that might influence flower visitations. Our choice of exotic and native plants was made based on our understanding of the most commonly planted ornamentals in the area². Our target plants were: Plants included the natives: Gold Star Esperanza, *Tecoma stans*; Furhmen's Red Texas Sage, *Salvia greggii*; Texas lantana, *Lantana urticoides*; Pam's Puryear Turk's Cap, *Malvaviscus drummondii*, Cenizo, *Leucophyllum frutescens* and the exotics: Spindle tree, *Euonymus japonica*, *Ixora maui*, Oleander, *Nerium oleander*, Texas Waxleaf Privet, *Ligustrum japonicum*; and Indian Hawthorn, *Raphiolepis X*.