

Introduction & Objectives

- Food that ends up in landfills produces methane and other greenhouse gases that contribute to climate change. In 2013 the United States alone disposed of an estimated 35 million tons of food waste into landfills. ¹ The nearby Miramar landfill was 88% full in 2015 and expected to reach capacity by 2022. ²
- The averaged daily percent of fullness of the dumpsters within the USD residence halls for the month of October 2017 was 67.8% (Fig. 1).
- Composting for residential gardens is the most sustainable practice for managing food waste. ³
- The objective of this project is to promote sustainability through gardens..

Research Questions:

1. Can community gardens promote sustainability through reducing food waste?
2. Can community gardens promote sustainability by implementing ecologically conscious practices?

Daily Averages for Residential Trash in October

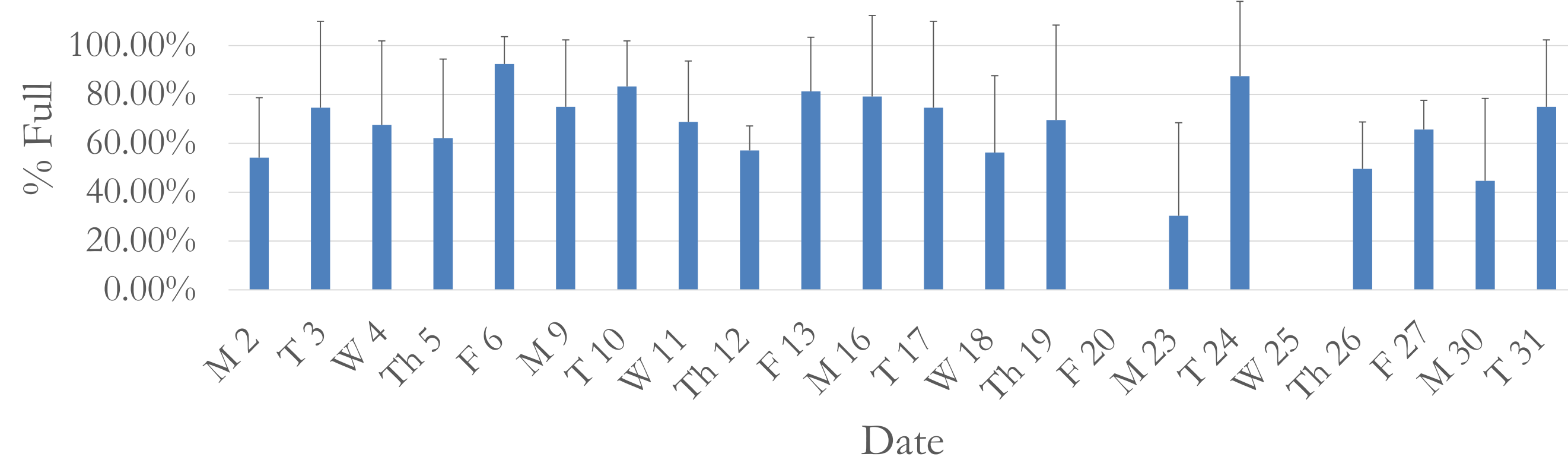


Figure 1. The daily average of trash for residence halls was calculated using data collected by visual waste audits conducted in the month of October 2017. Error bars represent standard deviation of the different dumpsters surveyed that day.

Methods

- **Community outreach (social capital)** The Garden club used the garden space behind Mission Crossroads for both active and passive recreation and to talk and educate about sustainability.
- **Waste Audits** provided estimated averages of trash and food waste in the residential halls.
- **Composting (food waste diversion)** 5 cubic yards of organic waste have been collected and composted in the garden over the past 2 years.
- **Ecosystem Stewardship (sustainable horticulture).** A variety of hardwood fruit trees for food provisions and California Natives for native wildlife was planted.

Future Methods:

- Itemized and more frequent waste audits
- More documented wildlife observations
- Campus survey on campus gardens and sustainability
- Create a GIS map showing campus capacity to produce food and spatial and temporal variations in soil testing.

Results

- Using a monthly average for residential waste and a liberal percentage of food waste at 40%, the estimated food waste in the residence halls is estimated to be near 2 cubic yards per month.
- During the past 2 years the Community Garden Project has produced approximately 3 cubic yards of matured organic compost that has been used in soil amendments.
- The animals observed in the garden over the past few years are indicators of a wildlife habitat within the garden (Table 1).
- Wildlife in the garden has made use of both exotic and native plants (Figure 2 & 3).

Observed Non-human Garden Visitors	Count
Hooded Orioles/nests (A)	4
Monarch Butterflies (B)	7
Honey Bees (C)	>10
Mourning Dove (D)	>10
Hummingbirds (E)	>10
San Diego Alligator Lizard	>10
Gray Bird Grasshopper	4
California Bush Rabbit	3
Cooper's Hawk	3
California King Snake	1
Ladybugs	>10
White Crowned Sparrow	9
Northern Mockingbird	2
California Scrub Jay	4

Table 1. wildlife species and count observed in the garden during random visits over a 2 year span. The lettered species are considered indicator species for a wildlife habitat.

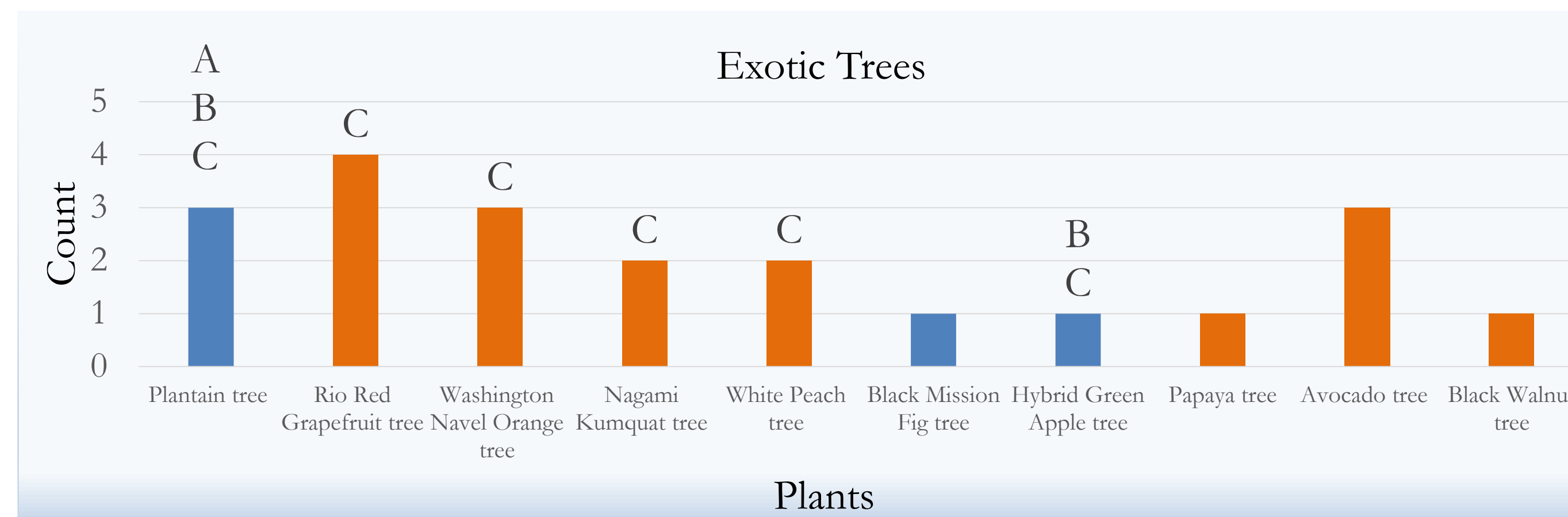
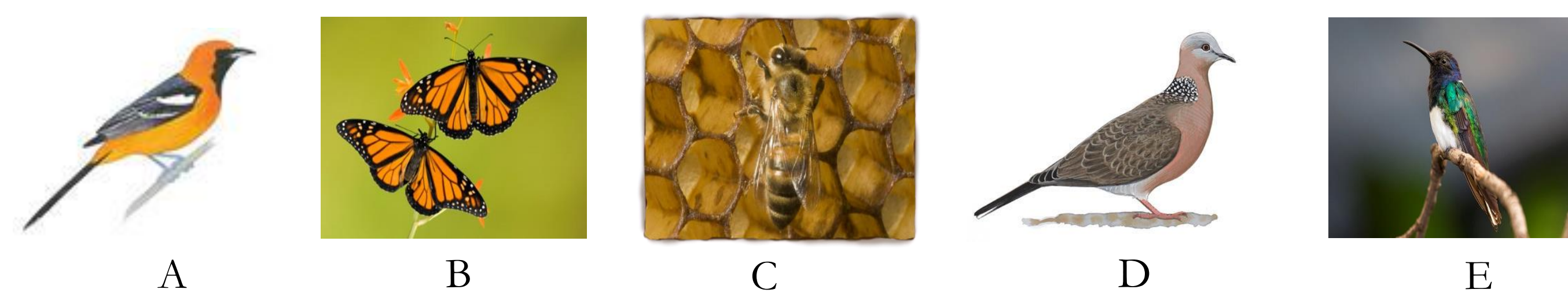


Figure 2. inventory of non-indigenous plant species in the garden. The blue bars represent plants that were transplanted prior to the Associated Students sustainability grant and the orange bars represent plants purchased with funds from the grant. The letter symbols above the bars represent the corresponding wildlife species observed with the plant.

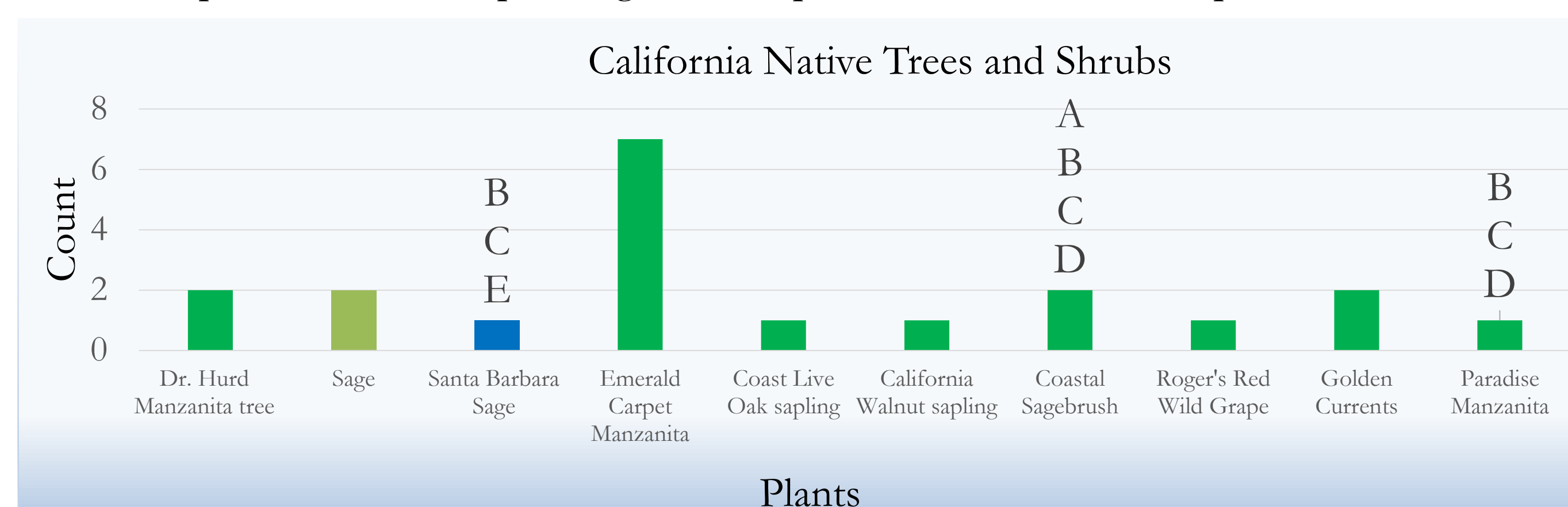


Figure 3. inventory of California native trees and shrubs currently in the garden. The blue bar represents a sage plant that was planted before the sustainability grant and the green bars represent California natives that were planted with funds from the grant. The letter symbols above the bars represent corresponding wildlife species observed with the plant.

Discussion

- **USD Garden Club** is focused on bringing the community to the garden to teach and learn about sustainability.
- **Implications** for sustainability on campus will be improved eco-system services(i.e. food provisions, pollination, seed dispersal and pest regulation). ⁴
- **Organic compost** used for amendments can drive significant positive changes in the soil's physical properties while diverting approximately 450 gallons of food waste from the landfill every month. ⁵
- **Future directions** of the garden will focus on concepts in Landscape ecology, urban food forestry, and green infrastructure that will provide a multifunctional landscape for not only the campus community, but for visiting wildlife. ⁶

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Figure 4. Garden Planting day.

Figure 5. Plants and tools purchased with AS grant.