

## Kika de la Garza Plant Materials Center

Kingsville, TX

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### AN EVALUATION OF FOUR FORBS FOR INCLUSION IN RANGE SEEDING MIXES AND WILDLIFE FOOD PLOTS IN SOUTH TEXAS

#### INTRODUCTION

Texas range seeding mixes commonly include a mix of grasses and forbs. Native, perennial forbs are commonly used in these range plantings. They are also commonly used in wildlife food plots. Illinois bundleflower (*Desmanthus illinoensis*) is one of the most important native, perennial legumes currently used in Texas range planting mixes. It is high in protein, readily eaten by both livestock and wildlife, and is often used as an indicator of range condition (Ajilvsgi, 1984). Awnless bushsunflower (*Simsia calva*) is another forb native to Texas. It has been used as forage for sheep and goats (Soil Conservation Service – United States Department of Agriculture, 1988). In addition, awnless bushsunflower has been found to be a good source of protein for deer (Schweitzer, Bryant, & Wester, 1993).

Other native, warm-season forbs have also been shown to provide a palatable food source for livestock and wildlife in Texas (Nelle, 1994). Orange zexmenia (*Zexmenia hispida*), also known as hairy wedelia (*Wedelia hispida*), is a common, native, warm-season, perennial forb. It is easily cultivated, and is often browsed by deer, sheep, and goats (Ajilvsgi, 1984). *Aphanostephus riddellii*, commonly known as perennial lazy daisy, has been found to be one of the most highly preferred food sources for white-tailed deer (Arnold & Drawe, 1979; Everitt & Drawe, 1974). In fact, Everitt and Drawe's 1974 study found perennial lazy daisy to be the most preferred spring food source of white-tailed deer, making up more than 12% of their early spring diet. Arnold and Drawe's study in 1979 found perennial lazy daisy to be "the second most heavily preferred species" of white-tailed deer over the course of a year.

Kika de la Garza Plant Materials Center in Kingsville, Texas, has conducted field evaluations using Illinois bundleflower, awnless bushsunflower, orange zexmenia, and perennial lazy daisy. Each species was evaluated for survival, plant hardiness, vegetative production, seed production, and other desirable characteristics. The purpose of this study was to evaluate each forb for potential inclusion in range seeding mixes and wildlife food plots for South Texas.

## **MATERIALS AND METHODS**

The Four Forb Plot consisted of four replications of four 15-foot sections of bedded rows, each containing 15 plants of a different forb species. Locations of each species within a replication were randomly selected. There is a five-foot wide alley between each replication, and a border row of orange zexmenia transplants on either side of the plot to control for an edge effect. Plants for this plot were grown individually in the greenhouse in seeded cones. They were transplanted by hand into their randomly assigned locations at one-foot intervals in April of 1998. They were irrigated immediately following planting, and as needed throughout the growing season. Plants were observed several times a month, and survival, hardiness, vegetative production, and seed production were all recorded.

On December 1, 1998, all rows were evaluated for plant survival. In addition, height and width measurements were taken from five randomly selected sample plants from each row. The condition of the plants was also recorded at that time.

## **RESULTS**

### **Plant Survival**

Orange zexmenia had the highest survival rate of the four forbs included in the plot, with 100 percent survival for all four replications. Perennial lazy daisy had the second best survival rate. Two replications of lazy daisy had 100 percent survival, while the other two replications had 93 percent and 86 percent survival, giving perennial lazy daisy an average survival rate of 94 percent. The awnless bushsunflower and Illinois bundleflower had very poor survival. The awnless bush sunflower had only two surviving plants in one replication, leaving it with an average survival rate of only 3 percent. The Illinois bundleflower did even worse, having no surviving plants in the entire plot (Table 1).

### **Plant Size**

Data on plant size was collected, not to compare species, but to provide an idea of the growth potential of each species in South Texas. Orange zexmenia has a rather shrubby growth form, and was the largest of the plants in the plot. It had an average height of 2.28 feet and an average width of 4.26 feet. Awnless bushsunflower was the next largest plant in the plot. The two surviving plants had an average height of 1.7 feet and an average width of 2.65 feet. Illinois bundleflower would have been the third largest plant in the plot; however, no data could be collected because there were no surviving plants. Perennial lazy daisy is a short wide herbaceous forb, and the smallest of the forbs included in this study. It was found to have an average plant height of .9250 feet and an average plant width of 2.155 feet (Table 2).

## **Plant Condition**

Plant condition for the Illinois bundleflower could not be recorded, as no specimens remained alive. The orange zexmenia and awnless bush sunflower were both at the end of their growth cycle, providing only stale, dry forage material at this time of year. The perennial lazy daisy was a pleasant surprise. It still had a lot of fresh green vegetative growth. Its ability to produce tender green forage at times when most other forbs are not, may be why it is such a highly preferred food source.

## **DISCUSSION**

Much of the death loss in the awnless bushsunflower occurred in August of 1998. Most of the plants died suddenly, and upon examination it was noted that roots were spongy-textured. Kleberg County Agricultural Extension Agent, John Ford, confirmed the cause of death of the bush sunflower to be cotton root rot, a soil borne virus. By the beginning of September, 1998, only two awnless bush sunflower survived. A rancher would need to consider the susceptibility to cotton root rot before including awnless bushsunflower in his range seeding mix. The other forbs in the plot appeared to be fairly resistant to the disease.

There was concern that the Illinois bundleflower would not be drought tolerant enough to survive the hot, dry, South Texas summer, but it surprised us by producing flowers and seed all the way through August. However, it began to die off during the heavy rains of September, 1998. By mid-October no surviving Illinois bundleflower plants remained. Although relatively drought tolerant, it appeared not to like extremely wet conditions following the long period of drought. Orange zexmenia, perennial lazy daisy, and the remaining awnless bushsunflower appeared to thrive under both wet and dry conditions.

Of the four forbs, orange zexmenia appears to be the hardiest of the species and also produced the most vegetation. It had 100 percent survival rate, and appears highly drought and wet tolerant. It produced multiple new seedlings near the existing plants. However, orange zexmenia tends to go dormant in early December. Perennial lazy daisy also had a good survival rate and appears to be tolerant of both wet and dry conditions. While it is a much smaller plant, it tends to produce new vegetative growth on a fairly continuous basis. It can be a good source of forage at times when other quality forage is scarce. It is also known to be a preferred source of food for white-tailed deer.

It is our recommendation that the characteristics of the individual range site be taken into account when choosing forbs to be included in a range seeding mix. A rancher may wish to consider Illinois bundleflower for inclusion in a range seeding mix if the planting site has well drained, sandier soils. Similarly, if the planting site has no

history of cotton root rot, a rancher might consider using awnless bushsunflower in a wildlife food plot. However, based on the results of this evaluation, orange zexmenia and perennial lazy daisy were found to be most suited to South Texas conditions, and we would recommend their inclusion in both range seeding mixes and wildlife food plots in South Texas.

Table 1.

PLANT SURVIVAL BY SPECIES AND REPLICATION			
Species	Replication	# Surviving	%Surviving
<b>Awnless Bushsunflower</b>	1	0	0
	2	0	0
	3	0	0
	4	2	13
	Total Plot	2	3
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<b>Illinois Bundleflower</b>	1	0	0
	2	0	0
	3	0	0
	4	0	0
	Total Plot	0	0
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<b>Orange Zexmenia</b>	1	15	100
	2	15	100
	3	15	100
	4	15	100
	Total Plot	60	100
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<b>Perennial Lazy Daisy</b>	1	15	100
	2	13	86
	3	14	93
	4	15	100
	Total Plot	57	94

Table 2.

**PLANT HEIGHT AND WIDTH BY SPECIES AND REPLICATION**

Species	Replication		Height (ft.)	Width(ft.)
Awnless Bushsunflower	4	Mean	1.7000	2.6500
		N	2	2
		SD	.2828	1.7678
	Total Plot	Mean	1.7000	2.6500
N		2	2	
SD		.2828	1.7678	
Illinois Bundleflower	No Data Available			
Orange Zexmenia	1	Mean	2.1200	3.7200
		N	5	5
		SD	.1304	.2775
	2	Mean	2.3400	4.1000
		N	5	5
		SD	.2191	.4528
	3	Mean	2.1200	4.5800
		N	5	5
		SD	.3701	.6797
	4	Mean	2.2800	4.1650
		N	5	5
		SD	.2280	.4980
	Total Plot	Mean	2.2150	4.1650
		N	60	60
		SD	.2519	.5566
Perennial Lazy Daisy	1	Mean	1.0000	2.3800
		N	5	5
		SD	.2121	.6458
	2	Mean	.9600	2.1400
		N	5	5
		SD	.1342	.6198
	3	Mean	.9000	2.2200
		N	5	5
		SD	.1414	.2049
	4	Mean	.8400	1.8800
		N	5	5
		SD	.1140	.2490
	Total Plot	Mean	.9250	2.1550
		N	60	60
		SD	.1552	.4740

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