

**National Park Service  
Plant Materials  
1991 Annual Report  
Wupatki National Monument,  
Arizona**

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**I. Background of Project**

An Agreement was made with Wupatki National Monument, Arizona and the Soil Conservation Service (SCS), New Mexico and Arizona. The Agreement was signed September, 1990. The purposes were to collect seeds and plants and to increase them for use on the Monument. The Agreement covers the period of 1990 through 1993.

Road construction was completed in September **1991**.

The Agreement provides for the production of **162** pounds of pure live seed and 500 container transplants.

Black grama and galleta, two of the targeted species, are poor producers of seed. As a new technique, we have attempted to grow container transplants from wildling grass clumps.

The National Park Service (NPS) designated a liaison person at the Monument. The SCS, Arizona provided staff assistance from the Flagstaff Area Office.

**II. Accessions Involved**

The following species are included in this project:

Common Name	Scientific Name	Plant Symbol	Accession Number
Indian ricegrass	<i>Oryzopsis hymenoides</i>	OrHy	9066070
Black grama	<i>Bouteloua eriopoda</i>	BoEr	9066053
Galleta	<i>Hilaria jamesii</i>	HiJa	9062882
Sideoats grama	<i>Bouteloua curtipendula</i>	BoCu	9062880
Blue grama	<i>Bouteloua gracilis</i>	BoGr	9062879
Spike dropseed	<i>Sporobolus contractus</i>	spco	9062881
Alkali sacaton	<i>Sporobolus airoides</i>	SpAi	9062883
Fourwing saltbush	<i>Atriplex canescens</i>	AtCa	9062884
Rabbitbrush	<i>Chrysothamnus nauseosus</i>	ChNa	9062885

III. Information

Collections were made at both proposed road construction sites, in the vicinity of the Citadel ruin. The collections have been combined and are considered as one population.

The site is described as rolling grassland, dominated by black grama and with a scattering of fourwing saltbush. Soils are gravelly, derived from volcanic ash. The elevation is 3,400 feet above sea level, and average annual rainfall is seven inches.

Collections were:

Date	Species	Field Collections (Uncleaned)
07/31/91	Indian ricegrass	175 gms
07/31/91	Galleta	800 sprigs
07/31/91	Black grama	1000 sprigs
09/15/91	Galleta	500 sprigs
09/15/91	Black grama	500 sprigs

IV. Seed Condition Information

Due to low precipitation at the Monument, plant growth was limited..

The indian ricegrass was cleaned in August, and yielded 40 grams. The seed was poor to good condition. Purity on germination was not determined.

V. Seed Production Establishment in 1991

Species	Contract Amounts	Estimated Production Per Acre	Acres Required for Production	Acres in Production	Stand Rating	Establishment Method
	92					
Black grama	15	15	1.00	.04	Good	Plants
Galleta	40	50	1.00	.07	Good	Plants
Alkali sacaton	12	100	0.25	0.14	Good	Plants
Spike dropseed	10	125	.25	0		
Sideoats grama	55	75	1.00	1.00	Good	Plants
Indian ricegrass	40			0.05		Seed
Globemallow						

\*See Table VII

Black grama and galleta sprigs continued to lose vigor throughout **1991**. There were only **415** individual plants remaining of galleta and **335** of black grama at planting. Additional collections of 1300 black grama and **1500** galleta sprigs were obtained in **1991**. However, these plants were not considered large or well rooted enough at planting time. We now have on hand 700 blue grama and **340** galleta plants which will be lined out in **1992**.

#### **VI. Seed Production**

No seed was produced in **1991**.

#### **VII. Transalant Production**

Species	Contract Amounts	Number in Production				Specialized Treatments
		Rootrainer 90	Rootrainer 350	Rootrainer 750	Treepots	
	<b>92</b>					
Fourwing saltbush	500		90	240	100	1
Rubber rabbitbrush	0		35	160		2
Spike dropseed	0	2200				

#### **VIII. Species or Cultural Trials**

No trials were started in **1991**.

#### **IX. Specialized Treatments**

- Fourwing saltbush seed was sown into Roottray seedling flats and cold stratified for four weeks. Germination was good. Seedlings were initially transplanted into Rootrainer 65 containers (1" x 1" x 4 1/4") using Metro Mix 360 growing medium. They were fertilized one to two times per week with Peter's Professional Fertilizer (**20-10-20**), applied by using 1:100 liquid fertilizer proportioner and a solution of one cup Peters in one gallon of water.

Fourwing saltbush seedlings were later transplanted from Rootrainer 65 containers to Rootrainer 350 (1 1/2" x 2" x 8" deep), Rootrainer

750 (2" x 2 1/2" x 10" deep) and one gallon treepots (4" x 4" x 14" deep), as indicated in Table VII. Metro Mix 360 growing medium was used in the Roottrainer 350 and 750 containers and a combination of Metro Mix 360 and compost (1:1) was used in the one gallon treepots.

2. Rubber rabbitbrush seed was sown into Rootray seedling flats and received no pretreatment. Germination was good. Seedlings were initially transplanted into Roottrainer 65 containers using Metro Mix 360 growing medium. They received the same fertilization as the fourwing saltbush seedlings.

Rubber rabbitbrush seedlings were later transplanted from Roottrainer 65 to Roottrainer 350, Roottrainer 750 and one gallon treepots, as indicated in Table VII. Metro Mix 360 growing medium was used in the Roottrainer 350 and 750 containers and a combination of Metro Mix 360 and compost (1:1) was used in the one gallon treepots.

## X. Observations

The black grama and galleta sprigs that we have been digging from the wild have not been transplanting very well. This may be due simply to poor vigor and transplant shock. However, if more transplants are needed to establish the production block, we would like to see the plants dug in spring or early summer to see if they transplant better at that time of year than the late summer/fall collections we have done.