



**CACTUS IN
SOUTHERN
NEVADA**



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Water Conservation

QUESTIONS ?

- 1. All cacti are desert plants and can do well in the southwest. T or F
- 2. Cacti are all native to the Americas except for one genus that is found in Africa and Southeast Asia. T or F
- 3. Desert plants, including cacti, can live
 - A. 50 years.
 - B. 25 years.
 - C. Hundreds of years.
 - D. Over 1,000 years.
 - E. All of the above
 - F. None of the above. They are short-lived plants.
- 4. Spines on cactus are mainly for protection from being eaten. T or F
- 5. Once planted and established in the landscape, cacti don't need to be watered. T or F
- 6. Because of their spines, cacti have few pests and predators in the landscape. T or F



CACTI, ETC. (Fat Plants).

(See description of the plants under the Latin generic names.)



Phyllocactus anguliger
(Leaf Cactus).



Fruit.



Blossom.



Sempervivum tectorum (House Leek).



Mesembryanthemum aureum (Midday Flower).



Crassula coccinea (Thick Leaf).



Aloe ferox.



Aloe ferox.



Echinocactus horizontalis
(Urchia Cactus).



Opuntia filipedula.



Fruit of the *Opuntia coccia*.



Cereus giganteus (Columnar Cactus).



Mammillaria pectinata
(Wart Cactus).



Cereus dasycanthus.



Agave horrida nana.

Stapelia variegata (Stapelia)

Opuntia coccinellifera.

Agave celsii.



WISH YOU WERE A CACTUS OR SUCCULENT?

WHO WOULDN'T?

BECAUSE THEY ARE



ARTFUL



THRIVE IN MOST SITUATIONS



AGE FABULOUSLY



AND GET ALONG SPLENDIDLY WITH
OTHERS

DAVID SALMAN HIGH COUNTRY GARDENS



WHAT WE CAN LEARN FROM A CACTUS



ENJOY AN ABUNDANCE OF SUNSHINE



ACCENTUATE YOUR STRONG POINTS



ANTICIPATE DRY SPELLS AND PLAN FOR THEM



RESOURCE CONSERVATION IS A LIFE SAVER



STAY SHARP



BE PATIENT, YOUR TIME TO BLOOM WILL COME



TRUE FRIENDS OVERLOOK YOUR SHARPEST FAULTS



SOMETIMES THE BEST PLACE TO GROW IS WHERE OTHERS CAN'T



NEVER LET YOUR GUARD DOWN IN HARSH CONDITIONS



ADAPTED FROM EARTH-SUN-MOON TEE SHIRTS





**“THE MOST SIGNIFICANT
LESSON THAT DESERT
DWELLERS CAN LEARN... IS
TO REGARD THEMSELVES
NOT AS EXILES FROM SOME
BETTER PLACE, BUT AS
PEOPLE AT HOME IN AN
ENVIRONMENT TO WHICH
LIFE CAN BE ADJUSTED.”**

(FORREST SHREVE RESEARCHER, AUTHOR OF “THE CACTUS AND ITS HOME”, 1931)



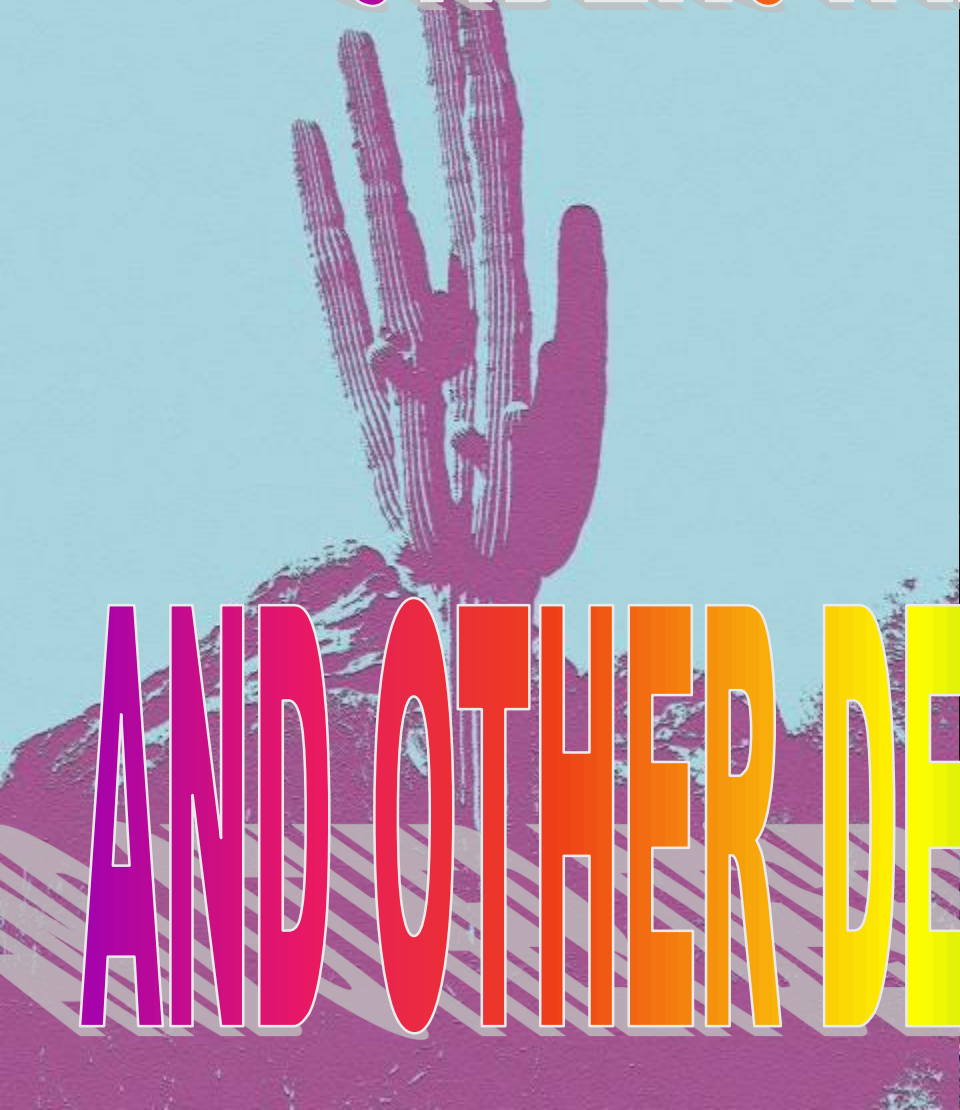


CONFUSED ABOUT CACTUS ?





UNDERSTANDING CACTI



AND OTHER DESERT PLANTS



THE TYPE OF CACTUS GROWING IN AN AREA WILL TELL YOU WHICH DESERT YOU ARE IN



**BEAVER TAIL CACTUS
THE
MOJAVE DESERT**



**SAGUARO CACTUS
THE SONORAN DESERT**

**CARDON CACTUS
THE
BAJA DESERT**



**SAGUAROS MENORAHIS
CACTUS
THE SINAI DESERT**

CACTI

- 1810-2000 SPECIES
- ALL CACTI ARE SUCCULENTS AND ARE NATIVE TO THE AMERICAS EXCEPT RHIPSALIS BACCIFERA WHICH IS FROM TROPICAL AFRICA (AN EPIPHYTE)



• CACTI CAN BE FROM .5 INCHES TO 330 FEET LONG

SELENICEREUS GRANDIFLORA



CACTI

CACTI ARE FOUND IN

 **HOT AND COLD DESERTS**

 **GRASSLANDS**

 **SHADY FORESTS**

 **RAINFORESTS**

 **AND IN COLD, WET OR SNOW COVERED
ALPINE ZONES ABOVE THE TREE LINE**

CACTI

- **CACTI ARE CATEGORIZED IN 3 SUBFAMILIES**
 1. **PERESKIOIDEAE**
 2. **OPUNTIOIDEAE**
 3. **CACTOIDEAE**
- **NO FOSSILS OF EARLY CACTI HAVE BEEN FOUND**



CHARACTERISTICS OF CACTI



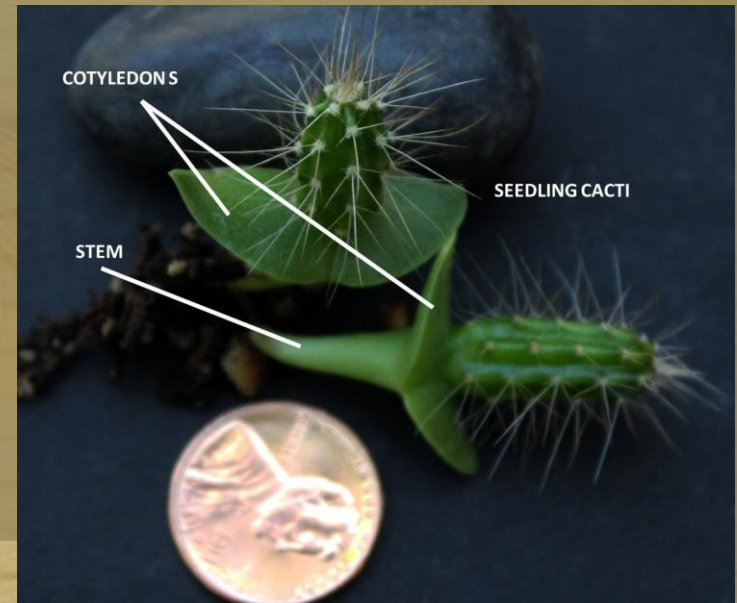
PERENNIAL



DICOTYLEDON, TWO LEAF EMBRYO

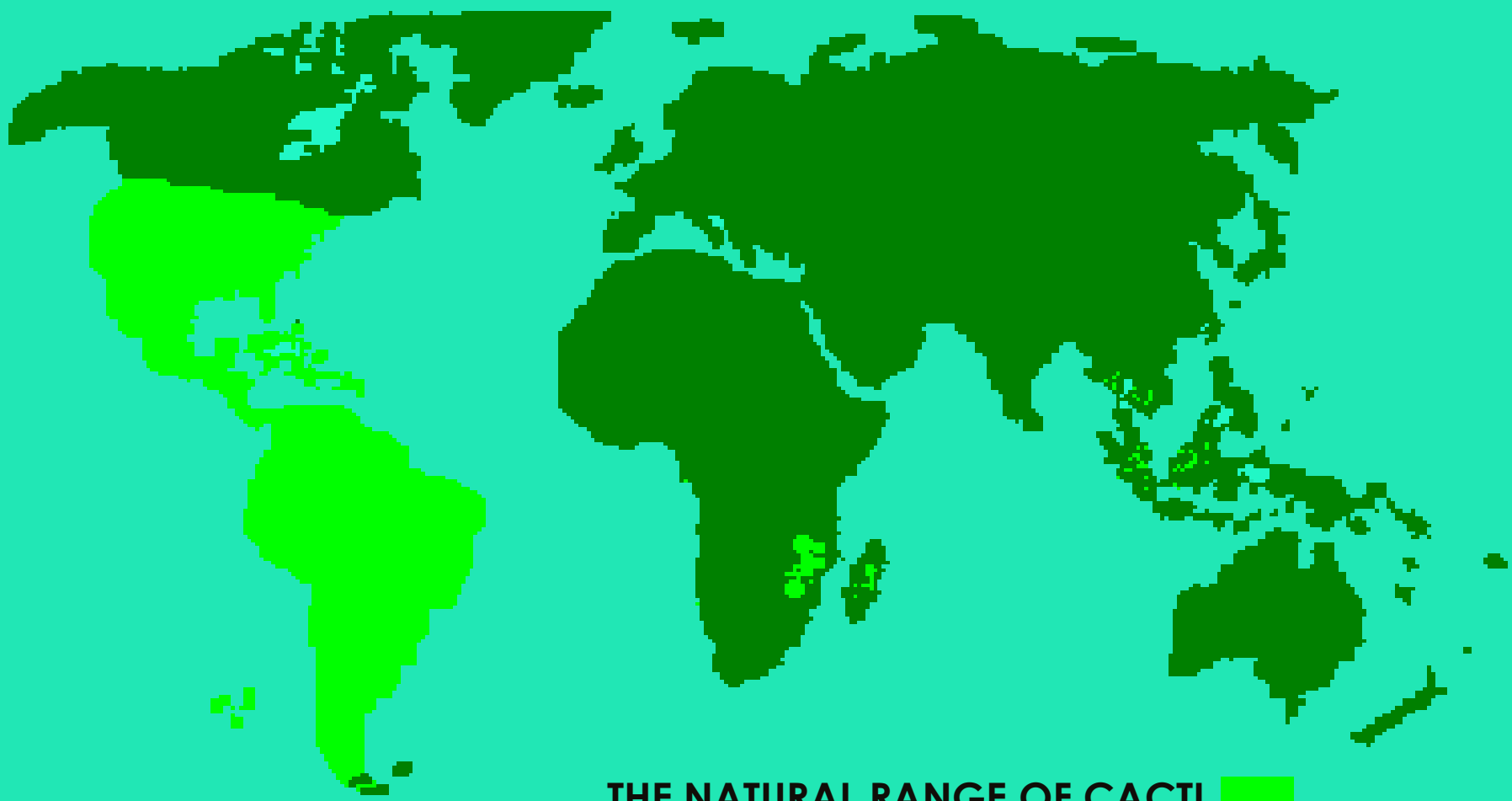


THE FRUIT IS SINGLE CELLED





CACTI EVOLVED 20 TO 30 MILLION YEARS AGO IN THE AMERICAS, WITH ONE EXCEPTION (THE FIRST LAND PLANTS APPEARED 500 MILLION YEARS AGO)



THE NATURAL RANGE OF CACTI 



CACTI

**LARGE TROPICAL
VINING SPECIES**



CACTI

FLOWERING
TROPICAL SPECIES

FLOWERING TROPICAL SPECIES

FLOWERING TROPICAL SPECIES
Epiphyllum





CACTI

**LARGE TROPICAL
TREE-LIKE SPECIES**





CACTI

LARGE DESERT TREE-LIKE SPECIES



CACTI



SOME CACTI THAT LIVE IN TROPICAL AND SUBTROPICAL DESERT AREAS HAVE EPIPHYTES GROWING ON THEM



OTHER CACTI LIVE IN DESERT AREAS WITH SNOW





CACTI

- CACTI VERY LARGE



CACTUS-LIKE PLANTS



- **CACTUS-LIKE PLANTS**

- **EUPHORBIAS**

NATIVE TO THE OLD WORLD, MOSTLY AFRICA



- **ALWAYS HAVE MILKY SAP WHEN CUT, LIKE THEIR RELATIVES THE POINSETTIAS**

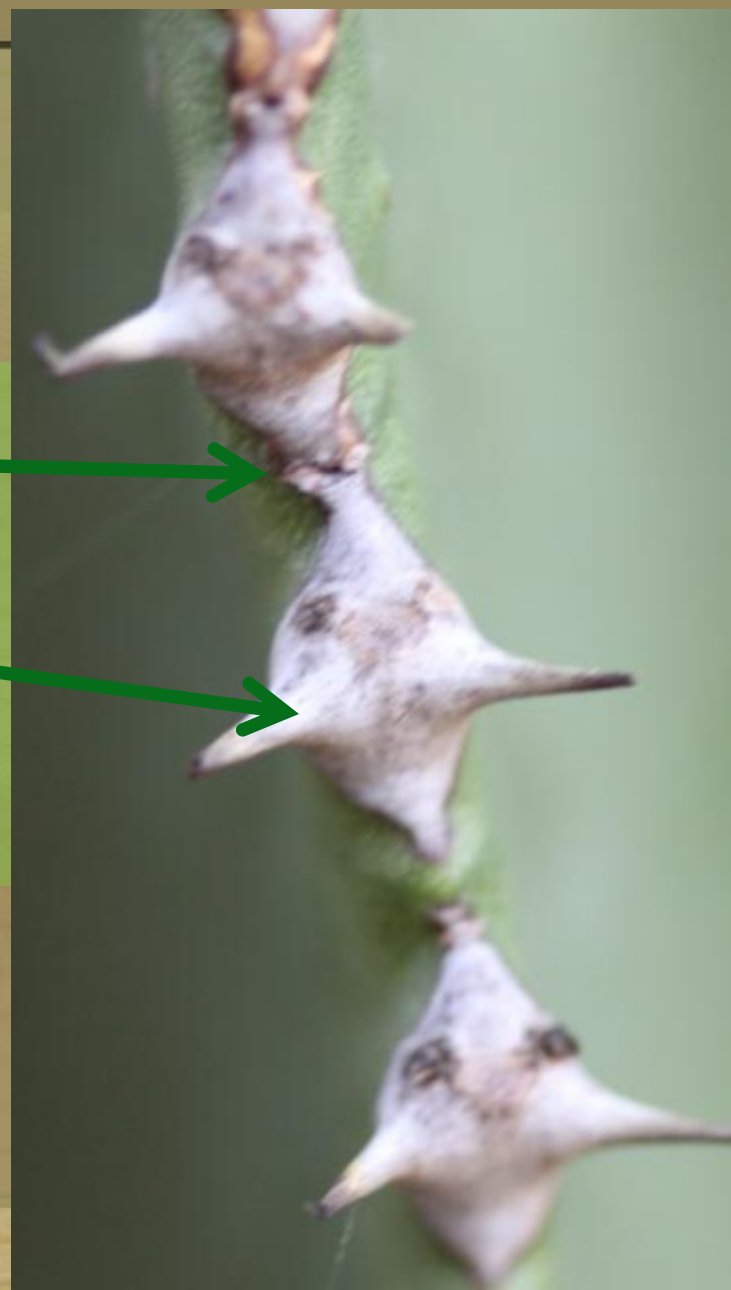


CACTUS-LIKE PLANTS

EUPHORBIAS HAVE

- NO AREOLES
- THEIR SPINES ARE ATTACHED TO A HORNY PLATE
- AND THEIR SPINES ARE BRANCHED

(SPINES ARE MODIFIED LEAVES)



CACTUS-LIKE PLANTS

E. PUNICEA



CACTUS-LIKE PLANTS



EUPHORBIA, TREE SIZE



CACTUS-LIKE PLANTS

PIARANTHUS

- CACTUS-LIKE PLANTS
STAPELIAS
CARRION OR STARFISH CACTUS
NATIVE TO AFRICA



CACTUS-LIKE PLANTS

- CACTUS-LIKE PLANTS
HUERNIA CONFUSA
LIFESAVER CACTUS
NATIVE TO AFRICA



CACTUS-LIKE PLANTS

- CACTUS-LIKE PLANTS
HOODIA GORDONII
NATIVE TO AFRICA



HOW DESERT PLANTS ADAPT TO SURVIVE



A. DESERT PLANTS STORE WATER IN STEMS OR TRUNKS (CACTUS, BURSERA, BOOJUM AND OCOTILLO)





**HOW DESERT PLANTS
ADAPT TO SURVIVE**

**DESERT
PLANTS
STORE WATER
IN STEMS OR
TRUNKS**

***BEAUCARNEA
(NOLINA)
RECURVATA
PONYTAIL
PALM***





HOW DESERT PLANTS ADAPT TO SURVIVE

B

- **LEAVES (AGAVES AND ALOES)**



CACTUS OR SUCCULENT GRAPE

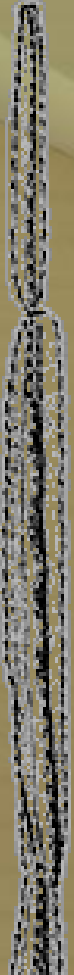


**MANY GROUPS OF PLANTS
HAVE SUCCULENT MEMBERS
SUCH AS THIS SUCCULENT
GRAPE, CYPHOSTEMMA
JUTTAE, WITH LARGE FLESHY
LEAVES AND LARGE CAUDEX
TRUNK**

HOW DESERT PLANTS ADAPT TO SURVIVE

C

- ROOTS (QUEEN OF THE NIGHT CACTUS)





HOW DESERT PLANTS ADAPT TO SURVIVE

- **ROOTS (QUEEN OF THE NIGHT CACTUS)**



PHOTO BY TCSS TUCSON CACTUS



PHOTO BY KEVIN BARBER
RAINBOWGARDENSBOOKSHOP.COM



HOW DESERT PLANTS ADAPT TO SURVIVE



**ROOTS: IPOMEA
MORNING GLORY**



HOW DESERT PLANTS ADAPT TO SURVIVE



THEY HIDE

LITHOPS IN A RIVER BED IN SOUTH AFRICA

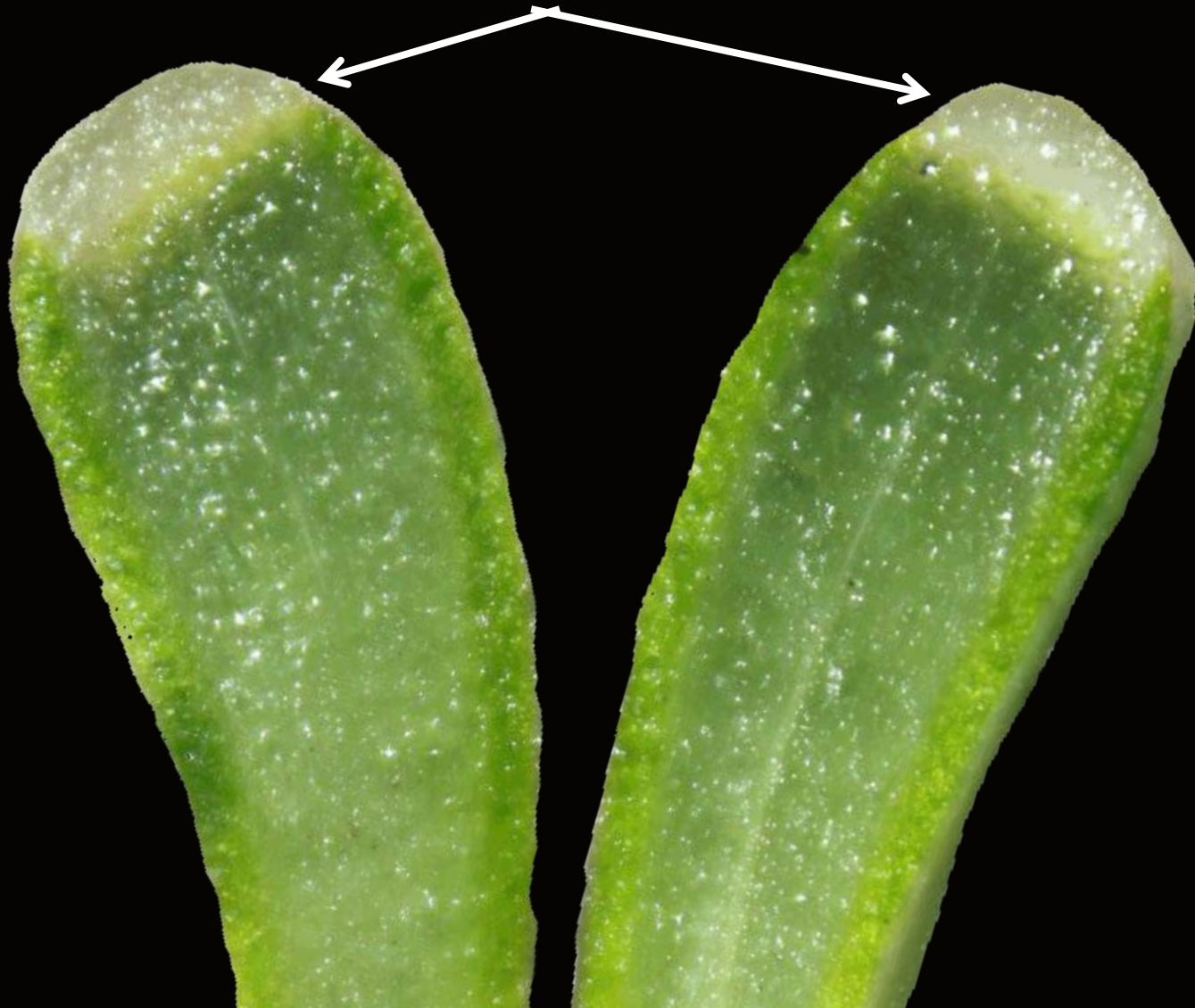


PHOTO BY JAN EMMING SOUTH AFRICA



HOW DESERT PLANTS ADAPT TO SURVIVE

WINDOWS FOR LIGHT TO ENTER FOR PHOTOSYNTHESIS





HOW DESERT PLANTS ADAPT TO SURVIVE

D

- LEAVES IN A FUNNEL SHAPE TO FACILITATE WATER TO THE ROOTS





HOW DESERT PLANTS ADAPT TO SURVIVE



**WELWITSCHIA BAINESII
(MIRABILIS) NOT A TRUE
SUCCULENT**

FROM SOUTH AFRICA

**CAN LIVE FROM 500 TO
1,000 YEARS (SOME CLAIM
2,000 YEARS)**

**ONLY TWO LEAVES THAT
CONTINUE TO GROW OVER
THE LIFE OF THE PLANT
STEMS AND ROOTS**

HOW DESERT PLANTS ADAPT TO SURVIVE

- E** DESERT PLANTS USE C.A.M. (CRASSULACEAN ACID METABOLISM)
- MOST PLANTS TAKE IN CARBON DIOXIDE AND RELEASE OXYGEN DURING THE DAY FOR PHOTOSYNTHESIS
- WATER IS LOST WHEN THE STOMATA OPEN FOR THIS PROCESS
- DESERT PLANTS TAKE IN CARBON DIOXIDE AND RELEASE OXYGEN AT NIGHT (C.A.M.) WHEN IT IS COOL AND MORE HUMID, STORING THE CO₂ FOR DAYTIME PHOTOSYNTHESIS
- THIS HELPS CONSERVE WATER

HOW DESERT PLANTS ADAPT TO SURVIVE

F

THEY DEVELOP EXTENSIVE SHALLOW ROOT SYSTEMS



MOST CACTUS ROOTS ARE FOUND IN THE TOP 3 INCHES OF SOIL



CORKY LAYER PREVENTS WATER LOSS



AFTER RAINFALL NEW ROOTS FORM TO SOAK UP WATER



DURING DROUGHT ROOTS SHRINK FORMING AIR POCKETS TO PREVENT WATER FROM ESCAPING BACK TO THE SOIL



MOST OF THE ABSORBING ROOT HAIRS ARE FOUND IN THE FIRST INCH OF TOP SOIL



EXTENSIVE ROOT SYSTEMS AID IN OBTAINING NUTRIENTS FROM POOR SOILS

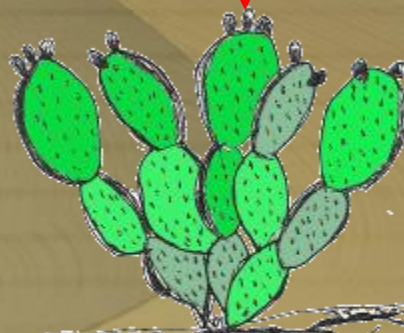


HOW DESERT PLANTS ADAPT TO SURVIVE



60 + ft.

ROOT SYSTEMS CAN
EXTEND FAR FROM
THE PLANT



THE MAJORITY OF
ABSORBING
ROOTS ARE
FOUND IN THE
TOP 3 INCHES OF
SOIL AND STORE
WATER AS A
THICKENED FLUID
IN SPECIAL
WATER-STORING
CELLS



**FIVE FOOT + RADIUS
OF ROOTS IN 2 YEARS**



**7 MONTH OLD CACTUS
SEEDLING ROOT SYSTEM**



12 feet








12 feet

HOW DESERT PLANTS ADAPT TO SURVIVE

G

DESERT PLANTS HAVE

-  **SMALL LEAVES**
-  **GRAY OR BLuish COLORED LEAVES**
-  **WAXY OR OTHER COATINGS ON THE LEAVES**
-  **PUBESCENCE ON THE LEAVES**
-  **ALL THESE CHARACTERISTICS HELP CONSERVE WATER**



HOW DESERT PLANTS ADAPT TO SURVIVE

H

 MANY DESERT PLANTS CAN PHOTOSYNTHESIZE WITHOUT LEAVES

 AN EXAMPLE IS THE THE PALO VERDE TREE'S GREEN TRUNK



CACTI



PHOTO BY JAN EMMING

**LEAVES: MOST LACK TYPICAL LEAVES
SPINES ARE MODIFIED LEAVES THAT
DEVELOP FROM THE AREOLES-THEY ARE NOT
THORNS***

- **SPINES SERVE SEVERAL PURPOSES**



MECHANICAL PROTECTION



CAMOUFLAGE



REFLECT LIGHT



SHADE THE STEM



REDUCE EVAPORATION (MODIFIED LEAVES)



REDUCE AIR MOVEMENT AROUND STEM



CONDENSE FOG INTO LIQUID THAT DRIPS TO THE GROUND



DIRECT RAIN TO THE GROUND



**SOME SPINES ARE DECIDUOUS (GLOCHIDS) FOR
PROTECTION AND FOR DISTRIBUTION**



PHOTO BY JAN EMMING

***THORNS ARE THE WOODY PART OF A STEM OF A WOODY TREE
OR SHRUB, ROSES HAVE PRICKLES**

SHADE GROWN

SUN GROWN

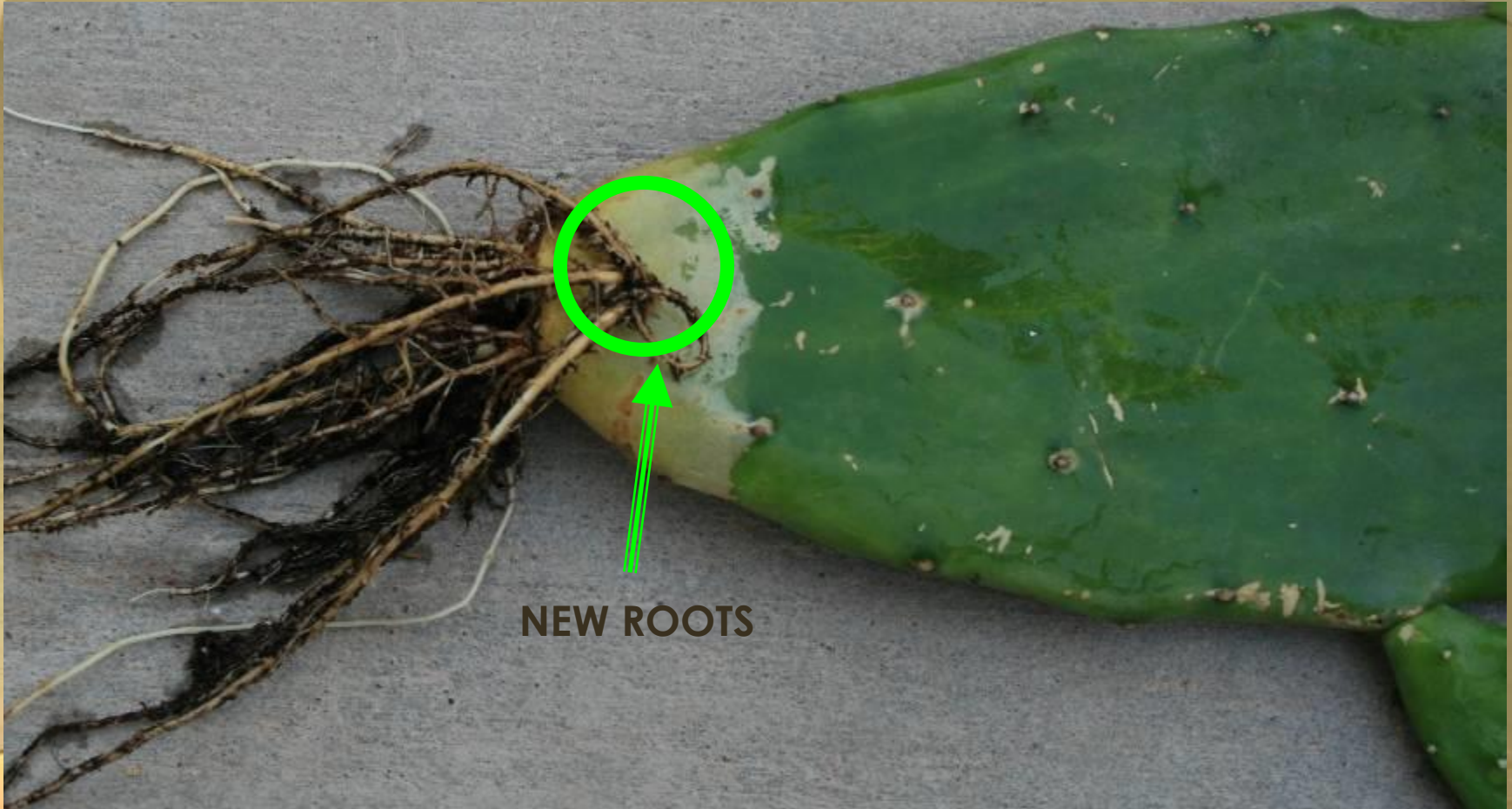


N THORNS ARE SHARP OUTGROWTHS FROM A STEM OTHER THAN AT A NODE; A MODIFIED STEM WITH NO AREOLES



CACTI

- CACTI DO NOT ALWAYS HAVE SPINES
- CACTI HAVE AREOLES FROM WHICH SPINES, NEW GROWTH, FLOWERS, AND ROOTS DEVELOP
- IF IT DOES NOT HAVE AREOLES, IT IS NOT A CACTUS



NEW ROOTS



CACTI



NEW GROWTH



CACTI



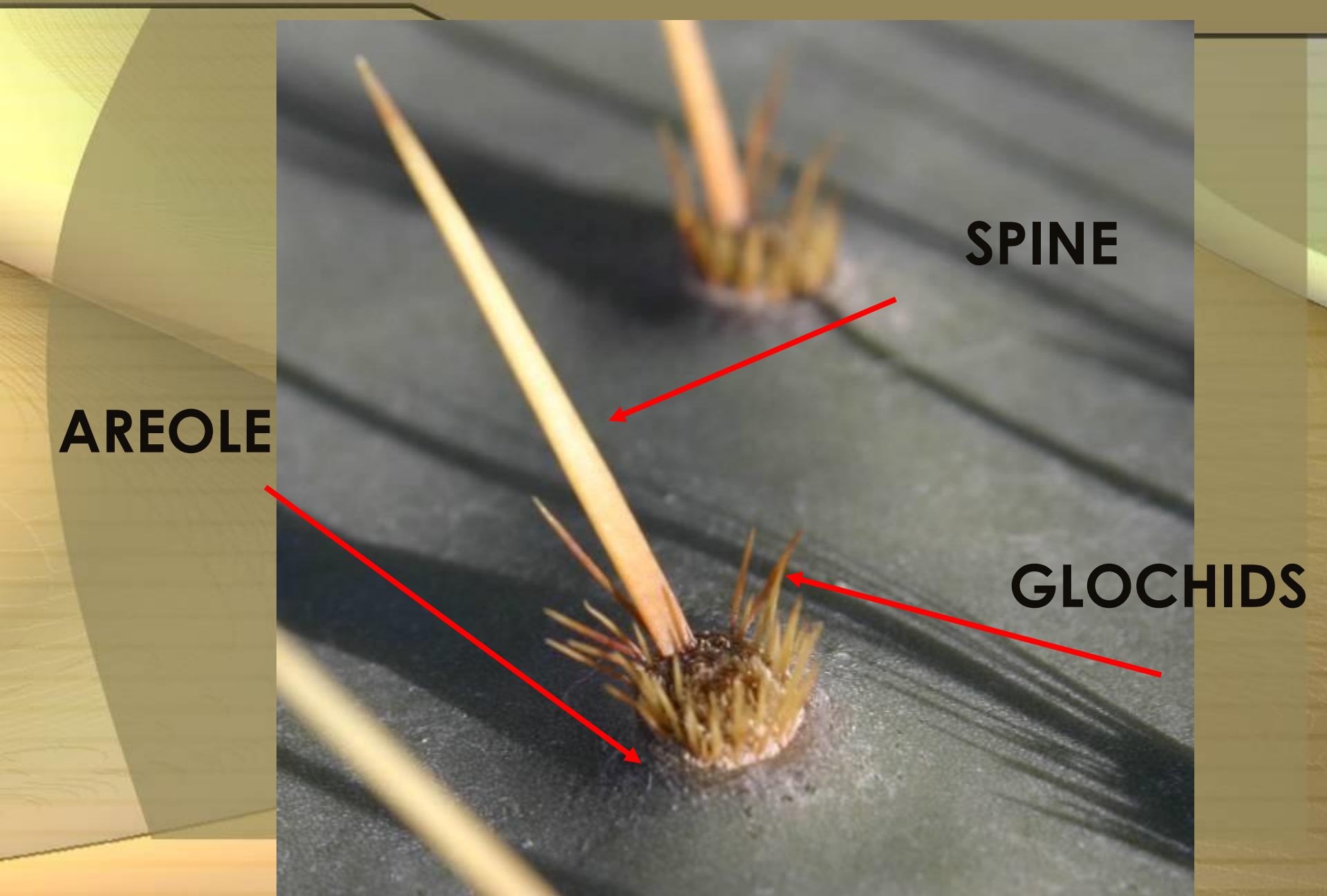
NEW FLOWER BUDS

CACTI

FLOWERS



OPUNTIA STEM JOINT



SPINE

AREOLE

GLOCHIDS



CARDON WITH 100+ YEARS OLD

AREOLE

SPINES



DECIDUOUS GLOCHIDS FROM ONE OPUNTIA MICRODASYS PAD



CACTI



AREOLES ARE SHORT INTERNODES WITH A BUD



MOST CACTI HAVE AREOLES THAT PRODUCE SPINES OR FLOWERS FOR ONE OR TWO YEARS



ROOTS: MOST CACTI HAVE SPREADING ROOTS JUST BELOW THE SURFACE OF THE SOIL



OTHERS HAVE A SMALL OR COMPACT ROOT SYSTEM NEAR THE SURFACE TO CATCH RAIN RUN OFF FROM THE PLANT ITSELF



SOME LIKE “QUEEN OF THE NIGHT” HAVE A LARGE STORAGE STEM MUCH LIKE A TUBER



NOT ALL CACTI ARE ARMED

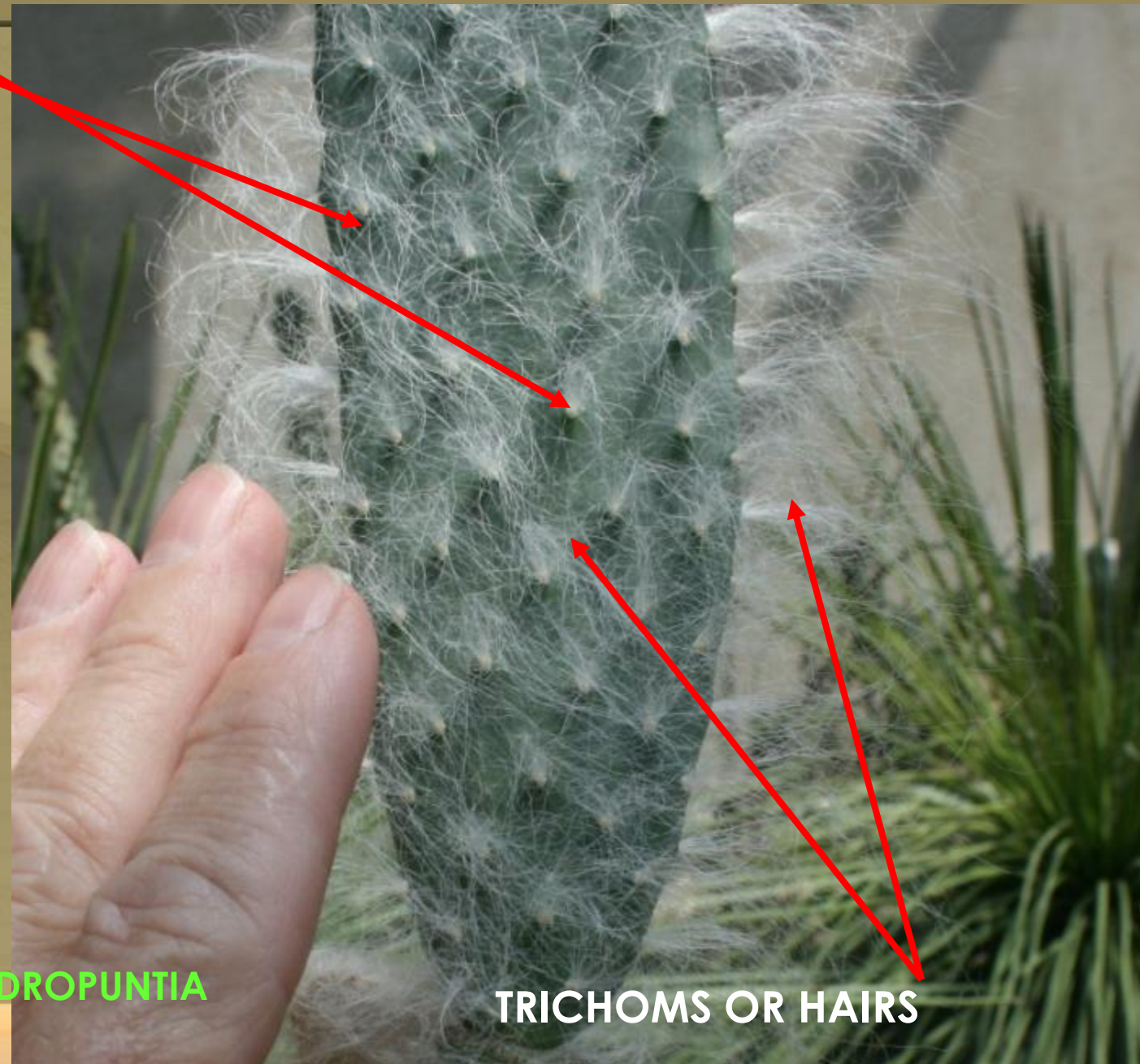


MAMMILLARIA
PLUMOSA



NOT ALL CACTI ARE ARMED

AREOLE



AUSTROCYLINDROPUNTIA

TRICHOMS OR HAIRS



SOME CACTI ARE ARMED








**SOME HAVE
LONG SPINES**

CACTI

**FLOWERS: MOST
ARISE FROM
AREOLES (SHORT
STEMS) NEAR ENDS
OF STEMS**



CACTI STEM

-  WHEN WELL WATERED, A CACTUS STEM IS MADE UP OF 75-95% WATER
-  THE RIBS AND TUBERCLES FACILITATE EXPANSION AND CONTRACTION
-  CACTUS PHOTOSYNTHESIS IS INEFFICIENT
-  SPHERICAL OR ROUND SHAPE IS THE BEST FOR WATER STORAGE, FORMS MAXIMUM STORAGE AND MINIMUM SURFACE AREA
-  WATER CONVERTED TO MUCILAGINOUS (THICK, GLUEY) SUBSTANCE WHICH DOES NOT EVAPORATE EASILY AND HAS A LOWER FREEZING POINT

CACTI SKIN



THE EPIDERMIS IS COVERED BY A WAXY LAYER, IT HELPS RETAIN WATER AND REFLECT LIGHT AND HEAT



THE HYPODERMIS IS A HARD LAYER UNDER THE EPIDERMIS THAT HELPS SUPPORT AND PROTECT FROM PREDATORS



AREOLE

SPINE (MODIFIED LEAF)

TUBERCLE

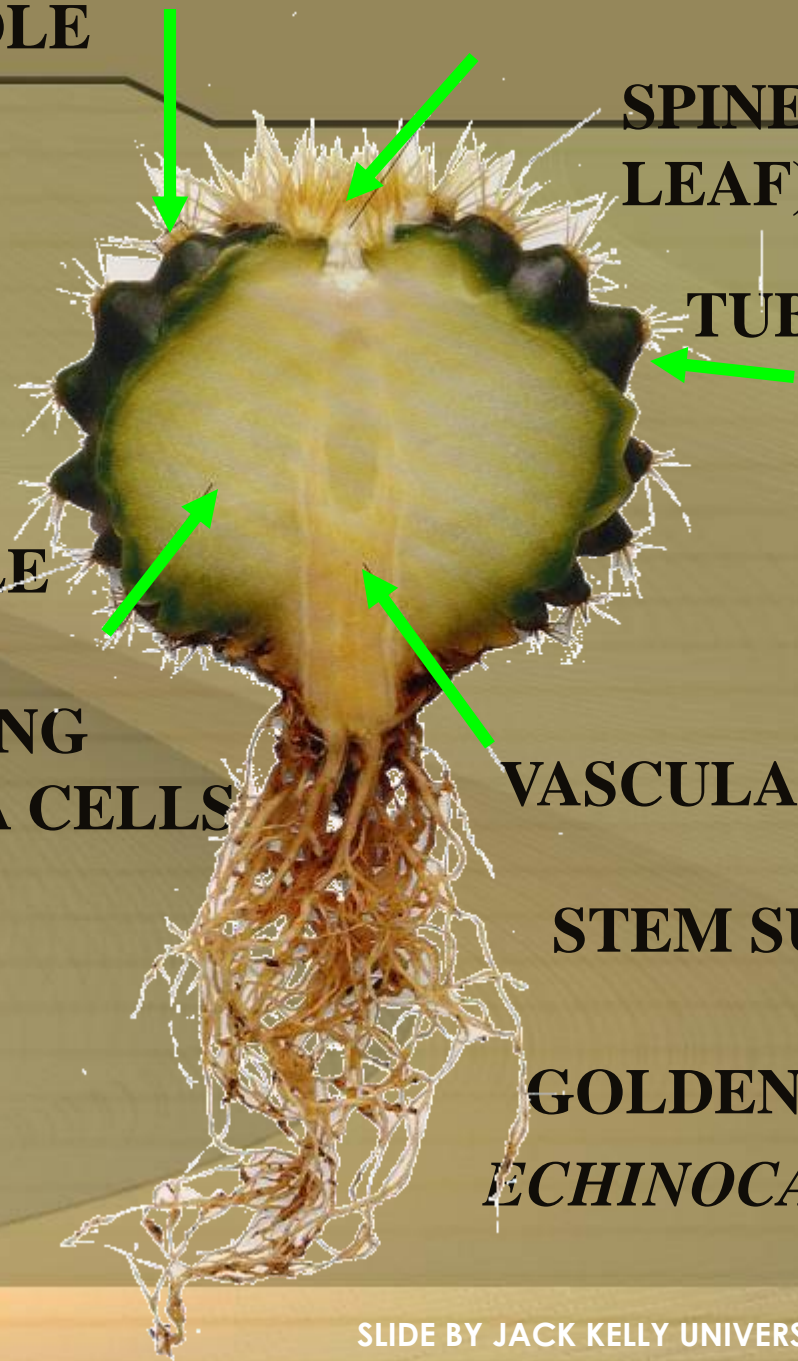
WAXY CUTICLE

WATER STORING PARENCHYMA CELLS

VASCULAR CYLINDER

STEM SUCCULENT

**GOLDEN BARREL CACTUS
*ECHINOCACTUS GRUNSONII***





COLUMNAR CACTI



**VASCULAR TISSUE
EMERGING AFTER
CUTTING**

**SOMETIMES CALLED
RIBS**



**VASCULAR TISSUE
OR WOODY RIBS AS
SEEN AFTER TRUNK
DAMAGE**



DESERT PLANTS GROW IN CHALLENGING PLACE



www.eagle-eye-adventures.com



PHOTO JAN EMMING

DESERT PLANTS GROW IN CHAL



COMMON USES

FOR CACTI



CACTI USES

- **FOOD:**

FRUITS

PADS (NOPALITOS)

- **ANIMAL FOOD**

- **MEDICINE**

- **CEREMONIAL AND RELIGIOUS USES**

- **LANDSCAPING**



CACTI USES



CANDLE MAKING



DYE (RED FROM COCHINEAL SCALE)



FENCES



FISH HOOKS



RAIN STICKS



FIREWOOD, SHELTER AND SHADE



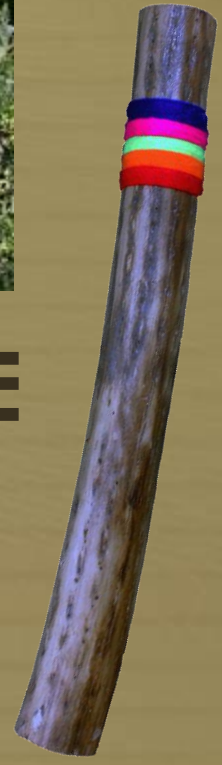
NEEDLES



PERFUME



SOAP



CACTI USES



THE AZTECS CULTIVATED OPUNTIA COCHENILLIFERA SPECIES AS THE HOST PLANTS FOR COCHINEAL SCALE



THE SCALE WAS CRUSHED TO MAKE DYE-RED FROM THE MALE-PURPLE FROM FEMALE



TODAY IT IS STILL USED IN FOOD COLORING, CLOTH AND LIPSTICK





CACTI USES FOOD



HYLOCEREUS UNDATUS



**DISCOVER
HAWAII GROWN
DRAGON FRUIT**

Dragon Fruit is a deliciously unique and luscious exotic. It is indigenous to Central America.

Slice, Peel, Scoop, or Blend

**SMOOTHIES * DESSERTS
TROPICAL DRINKS
SORBETS * SAUCES * GLAZES
SALADS * VINAGARETTES
& DECORATIVE GARNISH!**

Nutritional Values: Vitamin A & C, Potassium, Zinc, Antioxidants, High Fiber and Low Carbs

**Nature's Fluorescent Fruit
Kona Dragon Fruit, Inc.**

**Ready to Eat!
Best Served Chilled**

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**HYLOCEREUS
CACTUS VINES
WITH UNRIPE FRUIT**



**HYLOCEREUS CACTUS
WITH RIPENING FRUIT**





FLOWER END

**OLD FLOWER WITH
FRUIT FORMING**



STEM END





OPUNTIA FRUIT AND FIGS IN AMMAN JORDAN



XPRIA
MOBILE HOLDER
TYPE:3
JORDAN
QTY: 158 NOS
KAM

OPUNTIA GROWING IN AMMAN

Jordan



CACTI AND SUCCULENTS BENEFIT WILD LIFE





CACTI AND SUCCULENTS BENEFIT WILD LIFE

NESTING





CACTI BENEFIT WILD LIFE

NESTING



CACTI USES

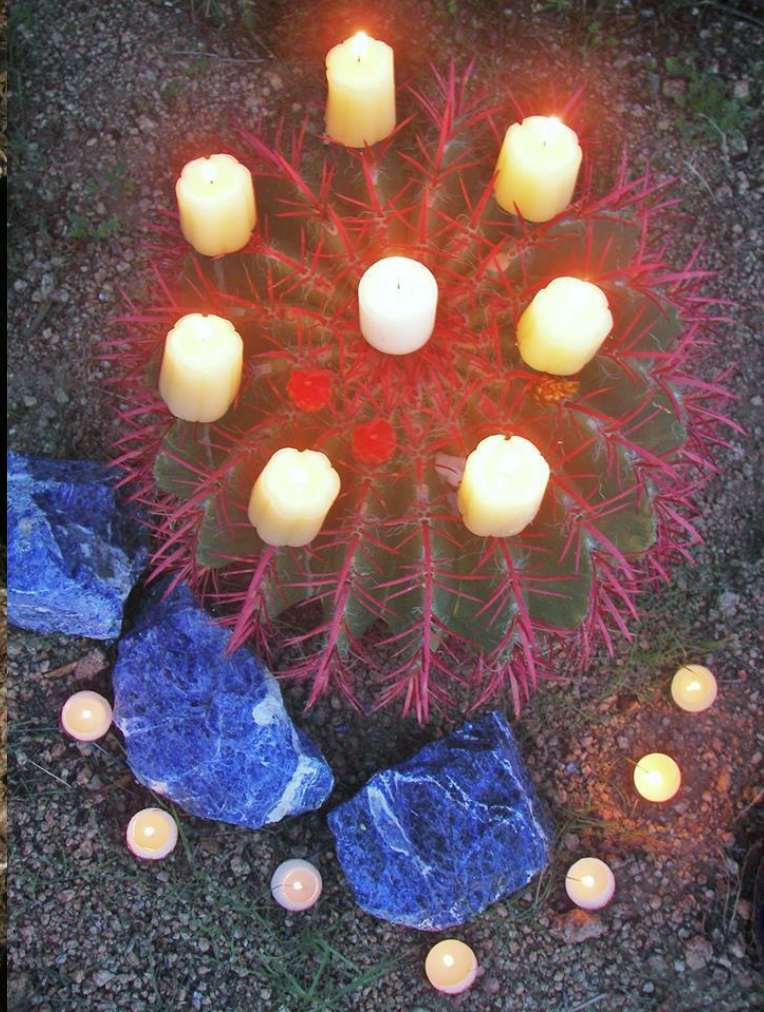


- **SAGUARO WOOD**

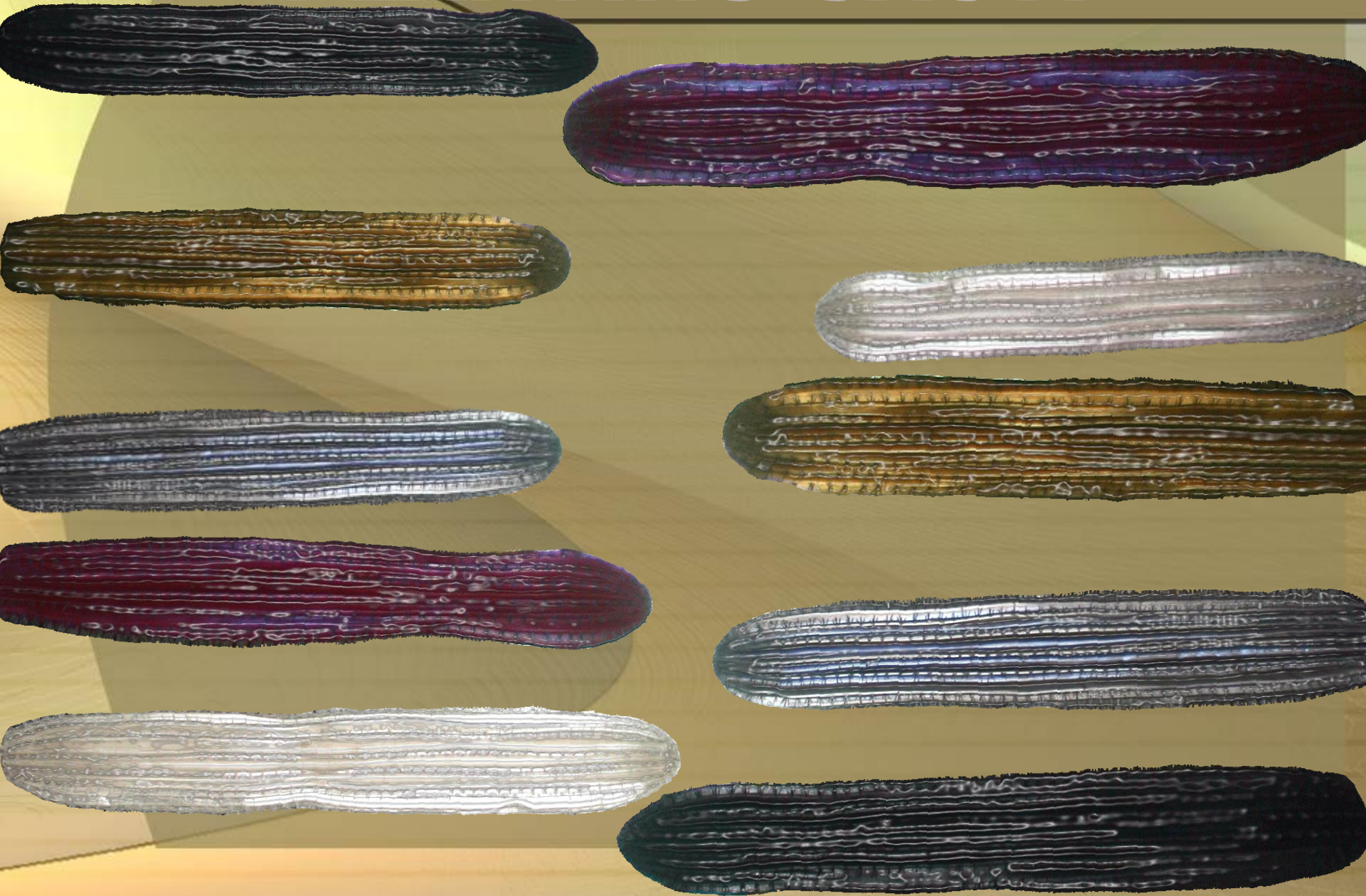
CACTI USES






SAGUARO WOOD RAMADA





PLANTING CACTI



PLANTING CACTI

-  **PLANT ONLY CACTI THAT ARE BEST SUITED TO YOUR CLIMATE**
-  **FOR BORDERLINE CACTI CHOOSE A GOOD MICRO-CLIMATE**
-  **PLANT IN WARM WEATHER TO ENHANCE ROOT DEVELOPMENT**

PLANTING CACTI

-  **DON'T PLANT DEEPER THAN IT WAS GROWN**
-  **CHECK THAT THE PLANT WAS NOT TOO DEEP IN THE POT**




PLANTING CACTI

-  **KNOW THE MATURE SIZE OF THE PLANT**
-  **PLANT WELL-ARMED CACTI AWAY FROM HIGH TRAFFIC AREAS**

**PLANTED
TOO CLOSE
TO
SIDEWALK
AND
DRIVEWAY**



PLANTING

-  **KNOW THE MATURE SIZE OF THE PLANT**
-  **PLANT WELL ARMED SUCCULENTS AWAY FROM HIGH TRAFFIC AREAS**

PLANTED TOO CLOSE TO THE SIDEWALK



PLANTING



**PLANTED TOO
CLOSE TO THE
SIDEWALK**



PLANTING

**PLANTED
TOO CLOSE
TO
SIDEWALKS
AND
DRIVEWAYS**



**ONE YEAR
LATER**





PLANTING



**PLANTED
TOO CLOSE
TO
SIDEWALKS
AND
DRIVEWAYS**



TOO LARGE FOR PLANTER





LOCAS POR LOS CACTUS





PLANTING CACTI



PLANTING CACTI

- **WATER THOROUGHLY AFTER PLANTING**
- **DETERMINE THE IRRIGATION SCHEDULE**
- **TOPDRESSING**

USE ROCKS OR GRAVEL

- **HELPS SUPPORT NEWLY PLANTED CACTI**
- **HELPS AREA NEAR STEM DRY FAST TO DISCOURAGE DISEASE**
- **PROVIDES AIR CIRCULATION**



PLANTING CACTI



PLANT IN WELL-DRAINED SOIL



PROVIDE ADEQUATE LIGHT INCLUDING FULL SUN AND FILTERED LIGHT OR SHADE



MANY SPECIES NEED TO BE SHADED WHILE ESTABLISHING



PHOTO JACK KELLY U of A



PHOTO JACK KELLY U of A



PLANTING CACTI

**PROTECT NEWLY PLANTED
CACTUS FROM WILDLIFE**





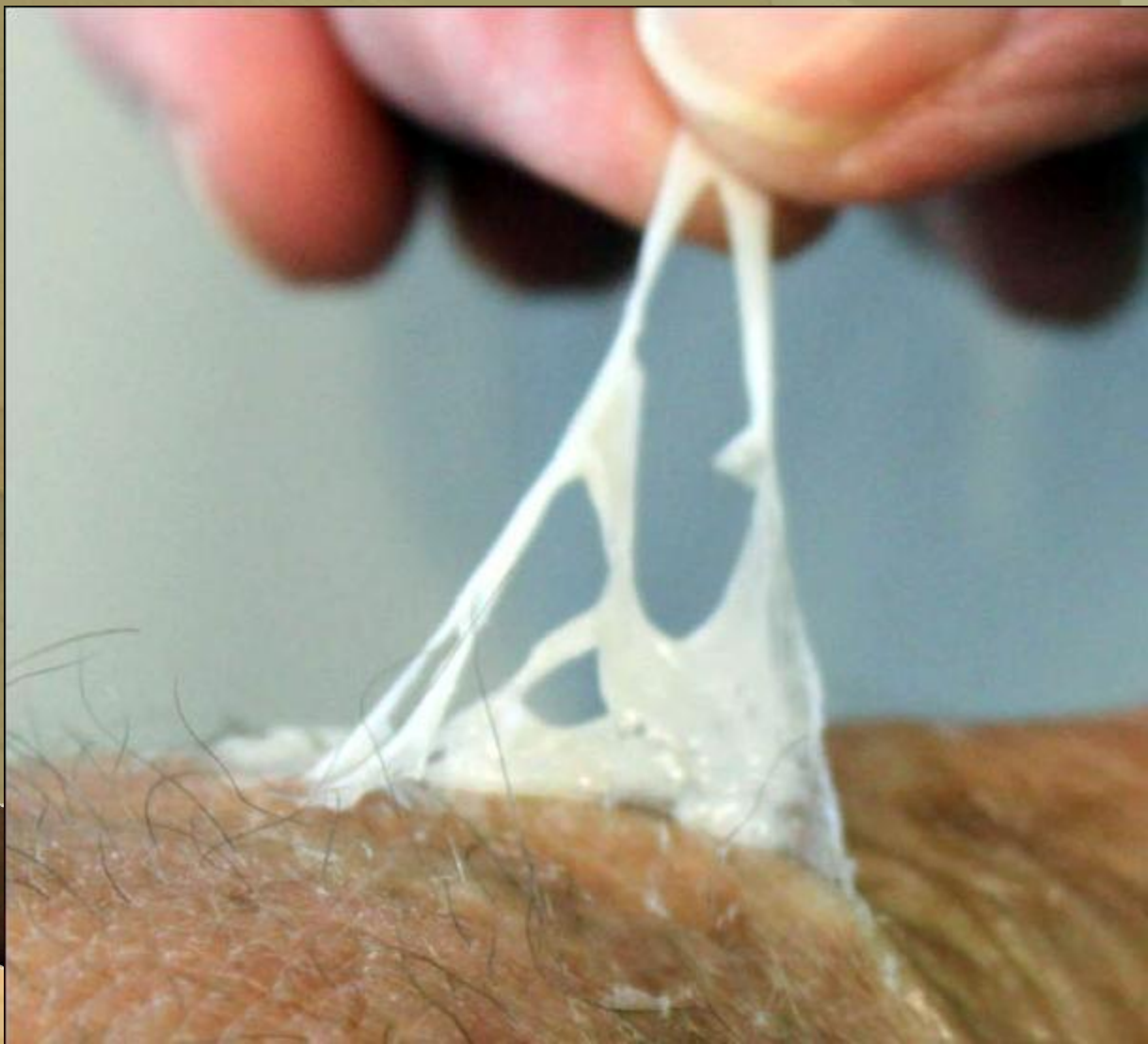
CACTI: TOOLS FOR PLANTING

- **TWEEZERS**



CACTI: TOOLS FOR PLANTING


- **GLUE TO REMOVE GLOCHIDS**





CACTI: TOOLS FOR PLANTING

 **SPRAY BOTTLE WITH SOAPY WATER**

 **FIRST AID KIT/ SAFETY GLASSES/
DUCT TAPE**

 **WARM TO HOT SALT WATER
FOR SOAKING**

 **WHITE GLUE TO REMOVE
GLOCHIDS IN HANDS
AND FINGERS**





CACTI: TOOLS FOR PLANTING



OLD GARDEN HOSE (4' TO 6' LONG), CACTUS, CARPET, LEATHER GLOVES



BAR B Q TONGS



TARP OR CARPET



HAND TRUCK



BIRD NETTING





BE CAREFUL MOVING CACTI





PLANTING CACTI



BE CAREFUL MOVING CACTI





POTLIFTER™





MOVING A LARGE BARREL CACTUS



MOVING A LARGE SAGUARO CACTUS



MOVING A LARGE SAGUARO CACTUS



PHOTOS BY JAN EMMING



TCSS CACTUS RESCUE FROM THE TUCSON CACTUS AND SUCCULENT SOCIETY FACEBOOK



**TCSS CACTUS RESCUE FROM THE TUCSON
CACTUS AND SUCCULENT SOCIETY
FACEBOOK**

CACTI: PLANTING IN THE LANDSCAPE



DIG THE HOLE 2 TO 3 TIMES THE SIZE OF THE ROOT BALL



FILL THE HOLE WITH WATER TWICE TO CHECK THE DRAINAGE RATE



THE HOLE SHOULD DRAIN IN A FEW MINUTES, NO LONGER THAN AN HOUR



CACTI MUST HAVE GOOD DRAINAGE



**NEVER PLANT CACTI IN
CLAY OR ANY OTHER
POORLY DRAINED SOILS!**



CACTI: PLANTING IN THE LANDSCAPE

WHEN MULCHING NEWLY PLANTED CACTUS, KEEP THE ROCK MULCH (DG) OFF THE CACTUS !





NEVER ASSUME THAT A PLANT IS PLANTED AT THE CORRECT DEPTH IN THE CONTAINER

THIS PLANT WAS PLANTED 3 TO 4 INCHES TOO DEEP IN THE CONTAINER

50% OF THE SOIL WAS REMOVED BEFORE PLANTING



IF PLANTED THAT DEEP IN THE LANDSCAPE IT WOULD HAVE ROTTED



NEVER ASSUME THAT A PLANT IS PLANTED AT THE CORRECT DEPTH IN THE CONTAINER



THIS 1 GALLON
BARREL CACTUS
HAS ALMOST NO
ROOTS



WHY STAKE CACTI?



Steve Plath Robert Höfberg



STAKING LARGE CACTI



STAKING LARGE CACTI





STAKING LARGE CACTI



CACTI: PLANTING IN THE LANDSCAPE



- ❑ NEVER STAKE NEXT TO THE STEM LIKE THIS WITH A REBAR
- ❑ IT CAN DAMAGE THE STEM AND ROOTS
- ❑ USE LARGE ROCK TO SUPPORT NEWLY PLANTED SMALL TO MEDIUM CACTUS PLANTS





CACTI: PLANTING IN THE LANDSCAPE



USE LARGE ROCK TO HELP SUPPORT NEWLY PLANTED SMALL TO MEDIUM CACTUS PLANTS UNTIL WELL ROOTED IN (6 TO 12 MONTHS)



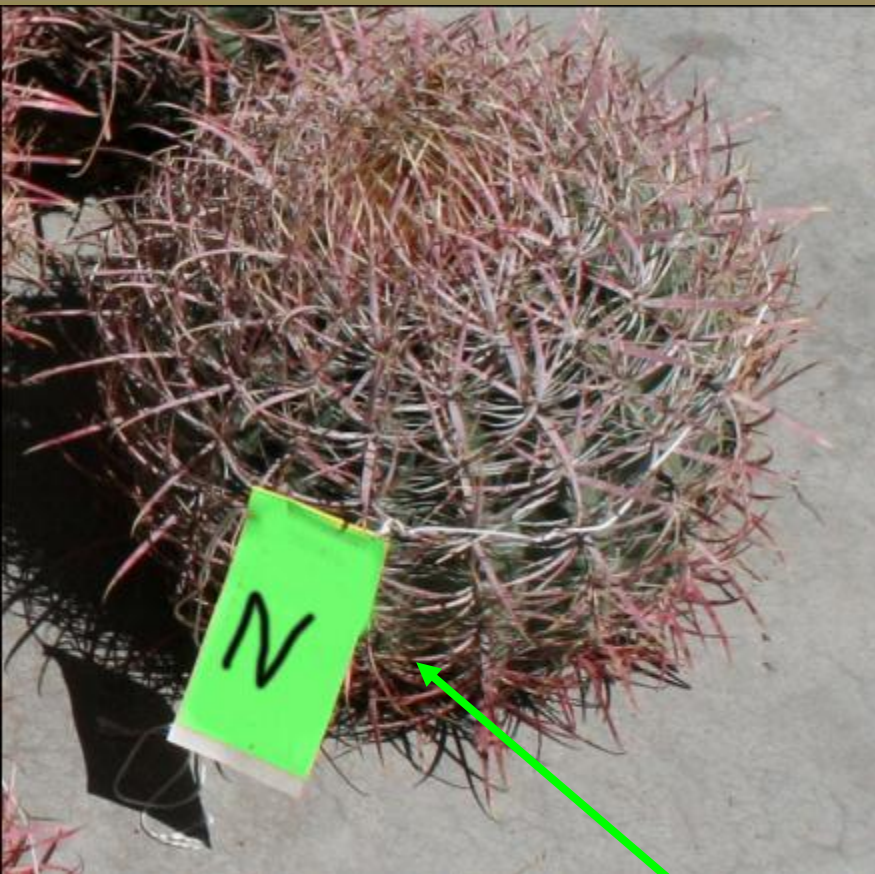
CACTI: PLANTING IN THE LANDSCAPE



USE ROCKS IN CONTAINERS OR CEMENT BLOCKS TO HELP SUPPORT NEWLY PLANTED SMALL TO MEDIUM CACTUS PLANTS



CACTI: PLANTING IN THE LANDSCAPE



IF TRANSPLANTING FROM LANDSCAPE ALWAYS MARK NORTH SIDE TO REPLANT IN THE SAME DIRECTION

MOVING LARGE CACTI



**DIG AS BIG A ROOT BALL AS
YOU CAN TRANSPORT**



**IF THERE ARE SINKER ROOTS DO
NOT CUT THEM OFF UNLESS
DAMAGED AND ONLY THE
DAMAGED PART**

**THE CACTUS NEED TO BE
WRAPPED TO PREVENT
DAMAGE DURING TRANSPORT**



HARVESTING WILD CACTI

- NEVER DIG CACTUS FROM PUBLIC LANDS
- ALWAYS GET WRITTEN PERMISSION WITH CORRECT NAMES (COMMON AND BOTANICAL) FROM LANDOWNERS BEFORE DIGGING WILD CACTUS
- WITH PERMISSION, DIG 5 OR FEWER CACTUS PER DAY, NO MORE THAN 7 CONTINUOUS DAYS

MUST HAVE A PERMIT TAG ON EACH PLANT



HARVESTING WILD CACTI



ON FEDERAL LAND THAT WILL BE DISTURBED, THE BUREAU OF LAND MANAGEMENT (BLM) WILL ALLOW DIGGING FOR \$5.00 PER TAG UP TO 10 TAGS, (\$50)





MUST WORK THROUGH THE BLM



DIGGING CACTUS FROM STATE LANDS, PRIVATE LANDS, AND PATENTED MINING LANDS IS UNDER THE SUPERVISION OF THE NEVADA DIVISION OF FORESTRY






HARVESTING WILD CACTI

-  **SUBMIT LETTER OF INTENT 10 DAYS OR MORE BEFORE DAY OF DIGGING**
-  **DIGGING ILLEGALLY CARRIES A FINE UP TO \$1,000 AND/OR SIX MONTHS IN JAIL**

MOST BARREL CACTUS PER SQ. FT IN THE WORLD ARE FOUND IN BLUE Dlamman D, NV



-  **BACK FILL WITH NATIVE SOIL (SOME USE CACTUS MIX IN BOTTOM OF HOLE)**
-  **STAKE IF NEEDED**
-  **NEVER PLANT DEEPER THAN THE CACTUS WAS GROWING IN CONTAINER OR IN THE GROUND**



OTHER TOOLS



CACTI: TOOLS FOR WEEDING

- **LARGE TWEEZERS**





CACTI: TOOLS FOR WEEDING

- **LARGE TWEEZERS**



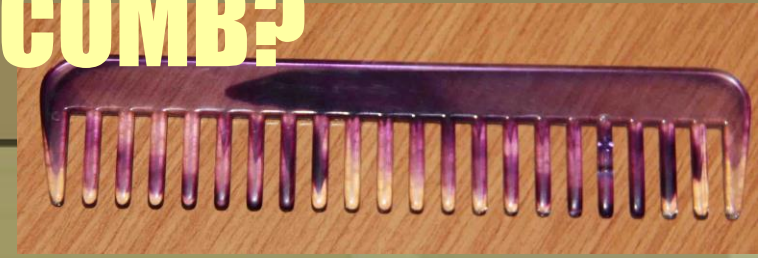


CACTI: TOOLS FOR PICKING UP SMALL POTS WITHOUT BEING POKED

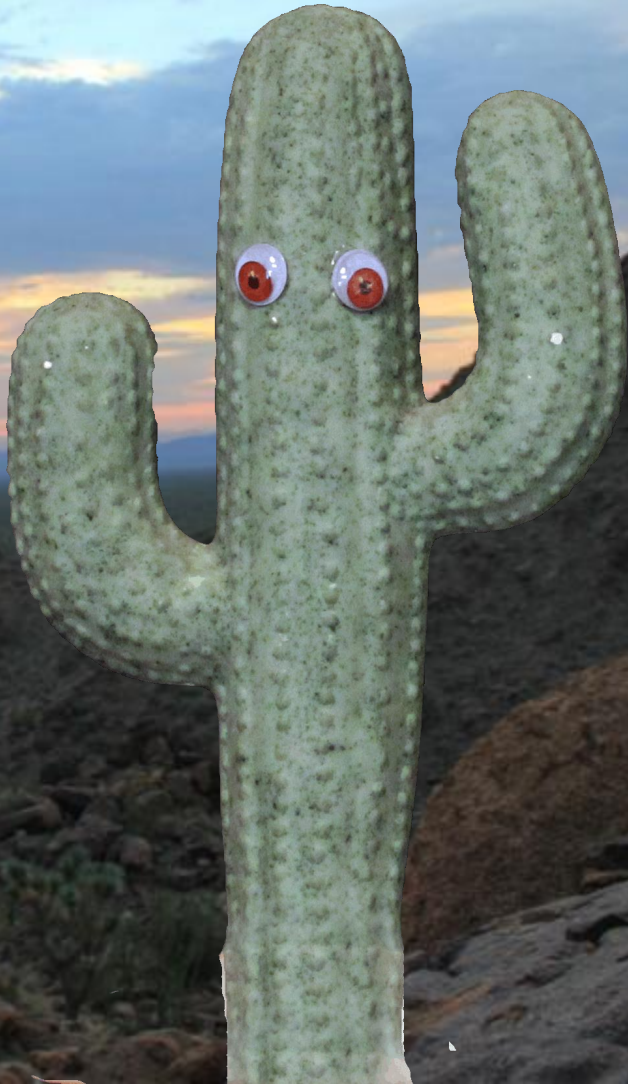
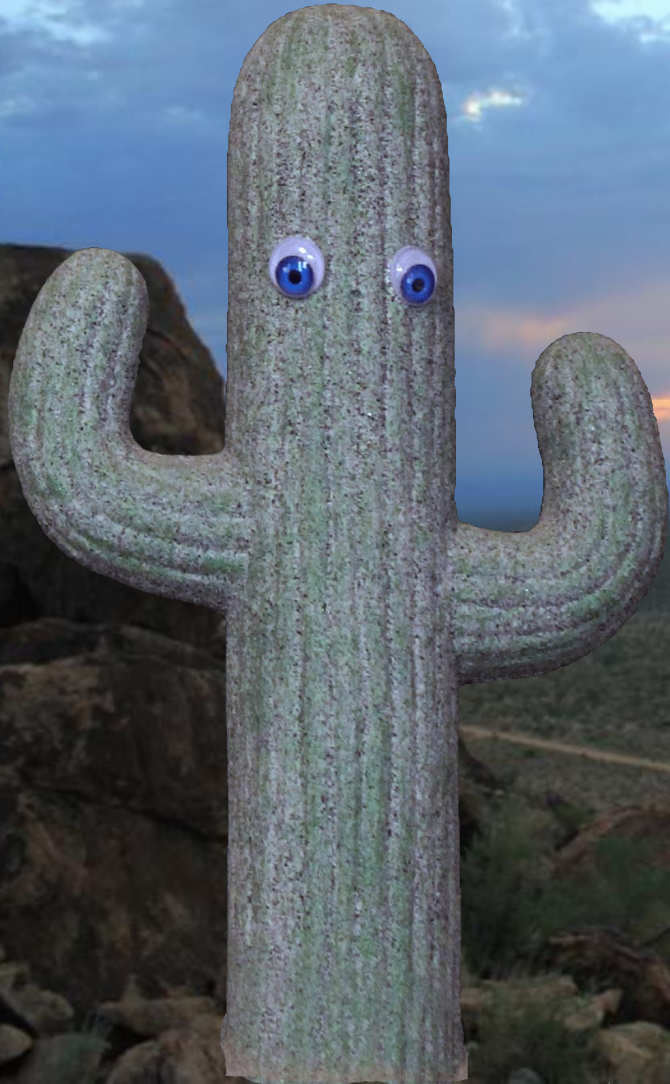


- FISHHOOK REMOVER

BIG TOOTHED COMB?



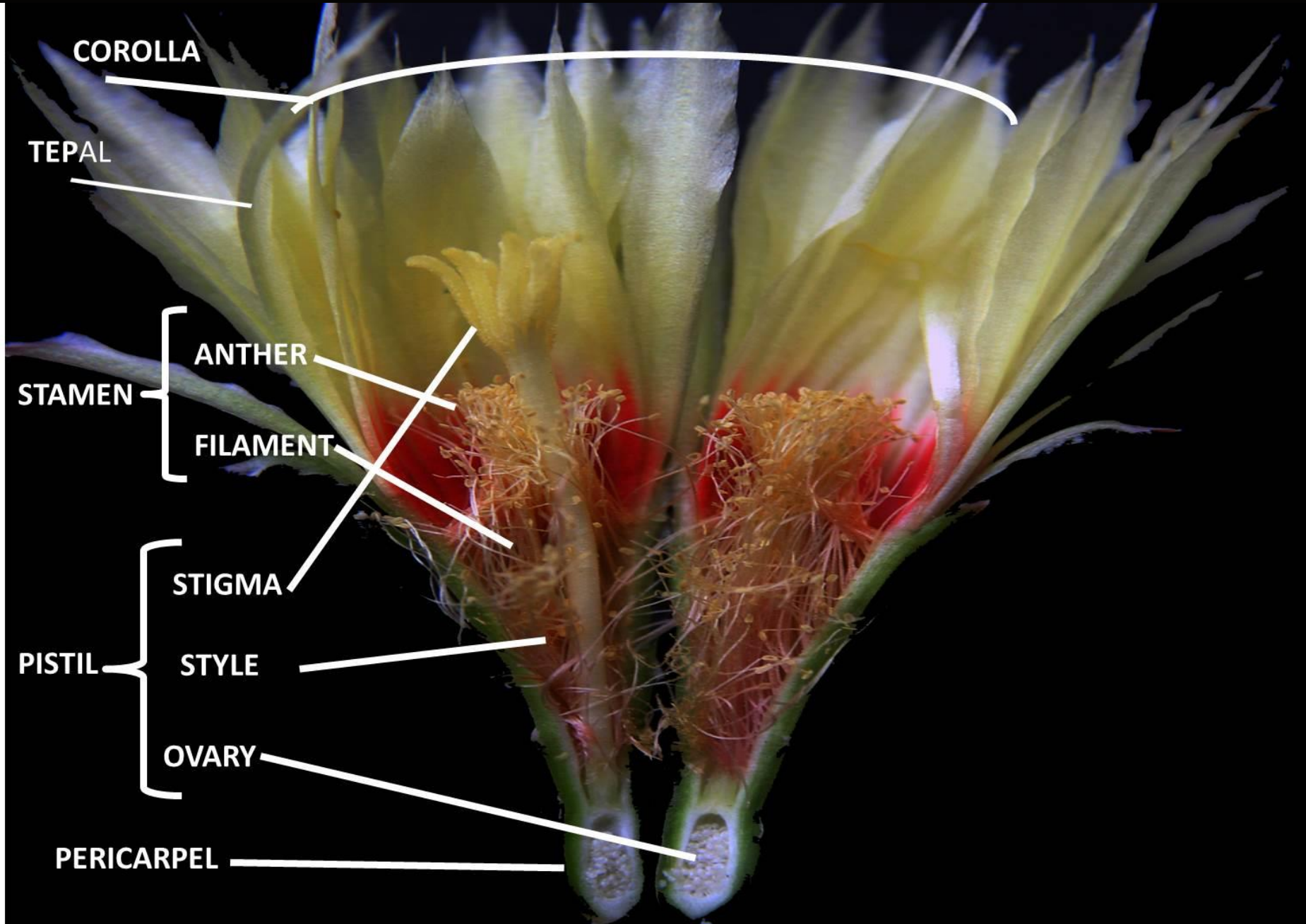
LET'S TAKE A
BREAK



PROPAGATING CACTI



THE CACTUS FLOWER



PROPAGATING CACTI

SEED GERMINATION

1. GOOD DRAINAGE
2. KEEP WARM
3. MOIST NOT WET
4. BRIGHT LIGHT
5. BOTTOM HEAT
6. LABEL
7. KEEP GOOD RECORD OF BOTH SUCCESSES AND FAILURES







PROPAGATING CACTI

NEWLY GERMINATED
CACTUS SEEDS



PROPAGATING CACTI



**NEWLY GERMINATED
CACTUS SEEDS**

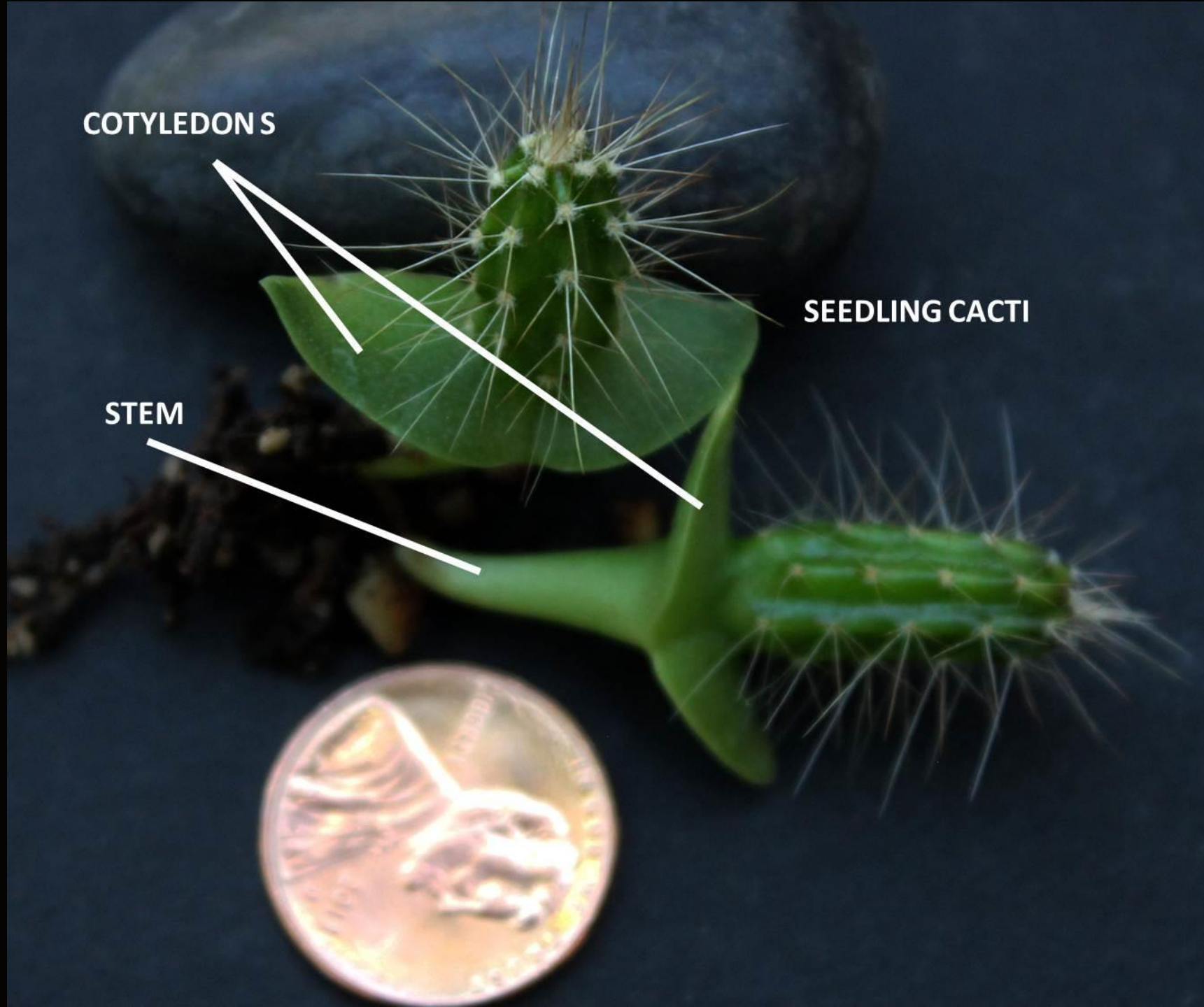




COTYLEDONS

SEEDLING CACTI

STEM





PROPAGATING CACTI

TRANSPLANTING SEEDLINGS





Notice the cactus growing under this bursage bush.

Bursage is an important desert shrub because it serves as a "nurse plant" that protects smaller, sensitive plants like the cactus.

Look for other plants growing under bursages.



MANY CACTI BEGIN LIFE IN THE SHADE. SOME STAY IN THE SHADE. OTHERS KILL THE NURSE PLANT TO GROW IN THE SUN AS AN ADULT



20 SAGUAROS UNDER ONE NURSE TREE



CACTI PROPAGATION

SEED MEDIUM



50% PUMICE



25% SAND



20% SPHAGNUM PEAT MOSS



5% VERMICULITE



TOP DRESS WITH 1/4 INCH OF
PUMICE OR BIRD GRAVEL



CACTI PROPAGATION



SAND

VERMICULITE

PERLITE

PEAT MOSS

PEAT MOSS & PERLITE MIX



COCONUT COIR

DG

ROCKS

PUMICE

CACTUS MIX








CACTI: TOOLS FOR PLANTING

- **CACTUS CUTTERS/DIVIDERS**



PROPAGATING CACTI

-  TAKE CUTTINGS FROM HEALTHY PLANTS
-  TAKE CUTTINGS DURING SUMMER
-  DRY OFF CUT ENDS (DUST WITH SULFUR*)
-  PLANT IN CLEAN, QUICK-DRAINING MEDIA
DON'T PLANT TOO DEEPLY-
-  CACTUS CAN BE ROOTED BY STANDING CUTTING ON THE SURFACE OF THE SOIL AND HOLDING IT IN PLACE WITH A STICK OR STONES

PROPAGATING CACTI



PLACE IN SHADE AND WATER REGULARLY



ALWAYS STERILIZE TOOLS BEFORE AND AFTER TAKING CUTTINGS



PLACE IN SHADE AND WATER REGULARLY



ALWAYS LABEL CORRECTLY

PROPAGATING CACTI

CUTTINGS



**PRICKLY PEAR AND CHOLLA
PROPAGATE ALMOST EXCLUSIVELY BY
CUTTINGS**



**MANY CACTI ARE EASY TO ROOT
WITHOUT ANY SPECIAL EQUIPMENT OR
GREENHOUSES**

PROPAGATING CACTI

CUTTINGS



THEY WILL OFTEN ROOT WHEREVER THEY TOUCH MOIST SOIL



UNUSUAL FORMS SUCH AS CRESTED OR FASCIATED CACTUS, CAN ONLY BE REPRODUCED VEGETATIVELY (CUTTINGS OR GRAFTING)

PROPAGATING CACTI

- STORE CUTTINGS UPRIGHT, NOT LAYING DOWN
- STORE IN THE SHADE
- IF A BUCKET OR POT IS USED, NEVER HAVE STANDING WATER IN IT





STORE CUTTINGS UPRIGHT



STORE CUTTINGS UPRIGHT





CUTTING OPUNTIA PADS INTO SMALL PIECES FOR PROPAGATION



PROPAGATING CACTI

CUTTINGS



AFTER 1 TO 2 MONTHS





PROPAGATING CACTI

CUTTINGS








3 TO 4 MONTHS

OR LONGER IN THE WINTER



WET CACTUS
ROT

PROPAGATING CACTI

-  TAKE CUTTINGS FROM HEALTHY PLANTS
-  TAKE CUTTINGS DURING SUMMER
-  DRY OFF CUT ENDS (DUST WITH SULFUR*)
-  STICK IN CLEAN, QUICK-DRAINING MEDIA
DON'T PLANT TOO DEEPLY-CACTUS CAN
BE ROOTED BY STANDING CUTTING ON
THE SURFACE OF THE SOIL AND HOLDING
IT IN PLACE WITH A STICK OR STONES
-  PLACE IN SHADE AND WATER REGULARLY

PROPAGATING CACTI

 ROOTING TYPICALLY OCCURS IN 3 WEEKS

 SOME GROWERS USE ROOTING
COMPOUND



CEREUS PERUVIANA (PERUVIAN APPLE
CACTUS)



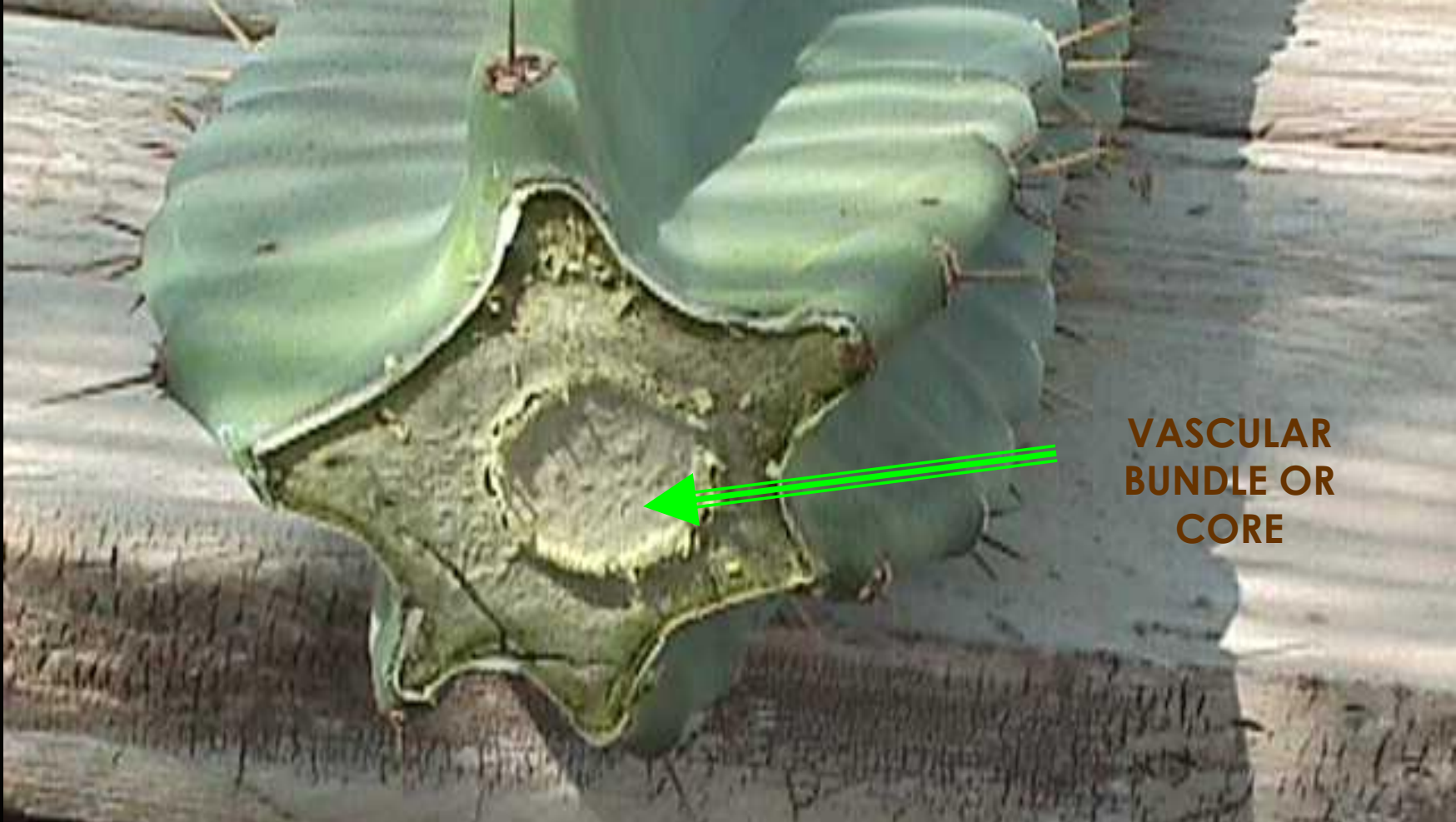
**CAREFULLY REMOVE THE CUTTING
FROM THE PARENT PLANT**



SCARS WILL BE PRESENT AFTER REMOVING A CUTTING. TAKE THE CUTTING FROM THE BACK OF THE PLANT TO HIDE THE SCAR.



NEW CUTTING SHOWING THE VASCULAR BUNDLE



**VASCULAR
BUNDLE OR
CORE**

**MOST COLUMNAR CACTUS
WILL ROOT FROM THE
VASCULAR BUNDLE**



**CUTTINGS STAY IN THE HOLDING AREA UNTIL
ROOTS EMERGE (ABOUT 2 –3 WEEKS)**



**AFTER 2- 3 WEEKS,
ROOTS WILL BEGIN TO
APPEAR. THE CUTTINGS
ARE READY TO PLANT**





**MAKE CUTTINGS
AND MOVE TO POTS
TO DRY**



**TRANSPLANT WHEN
THE CUTTINGS ROOT**

**USE A POTTING SOIL THAT DRAINS
FAST AND A CONTAINER THAT IS
NOT TOO LARGE-THIS PREVENTS
ROTTING -FOR SUPPORT ADD ROCK
OR PUMICE ON TOP OF THE SOIL**

**PLACE PREPARED MEDIUM IN A CONTAINER
SLIGHTLY LARGER THAN THE CUTTING'S
DIAMETER**



USE RECYCLED STYROFOAM OR SMALL POTS TO HOLD THE CACTUS UP UNTIL IT IS ROOTED



TRANSPLANT WHEN
THE CUTTINGS ROOT



RE-GROWTH AFTER CUTTINGS ARE TAKEN





CACTI PROPAGATION

- DIVISIONS



NEW PUPS





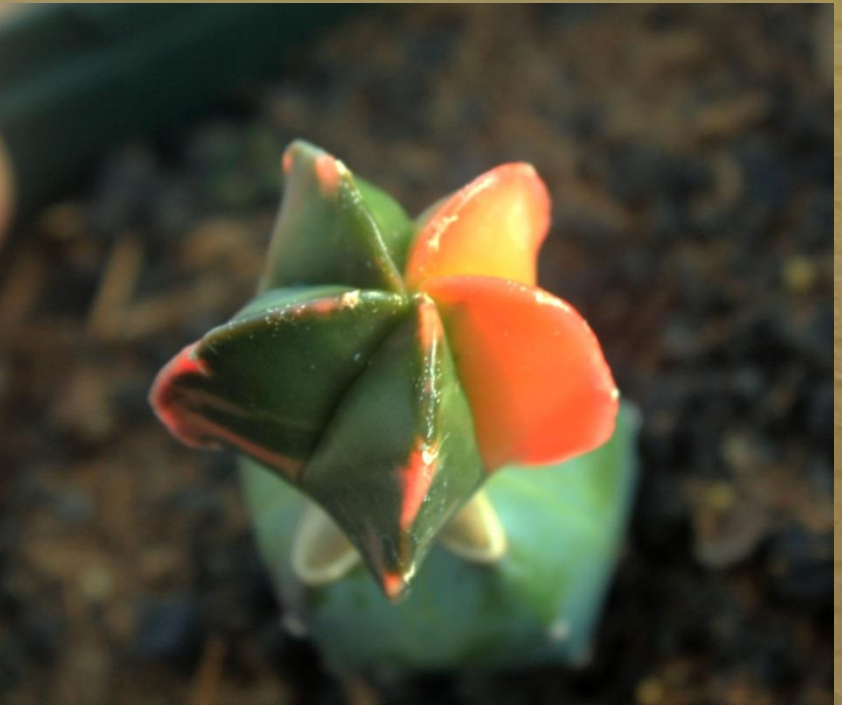
CACTI PROPAGATION

HYLOCEREUS UNDATUS
(TRIGONUS)
(ROOT STOCK)

- **GRAFTING**



MOON CACTUS
GYMNOCALYCIUM MIHANOVICHII



CACTI PROPAGATION

- **GRAFTED MOON CACTUS BLOOMING**



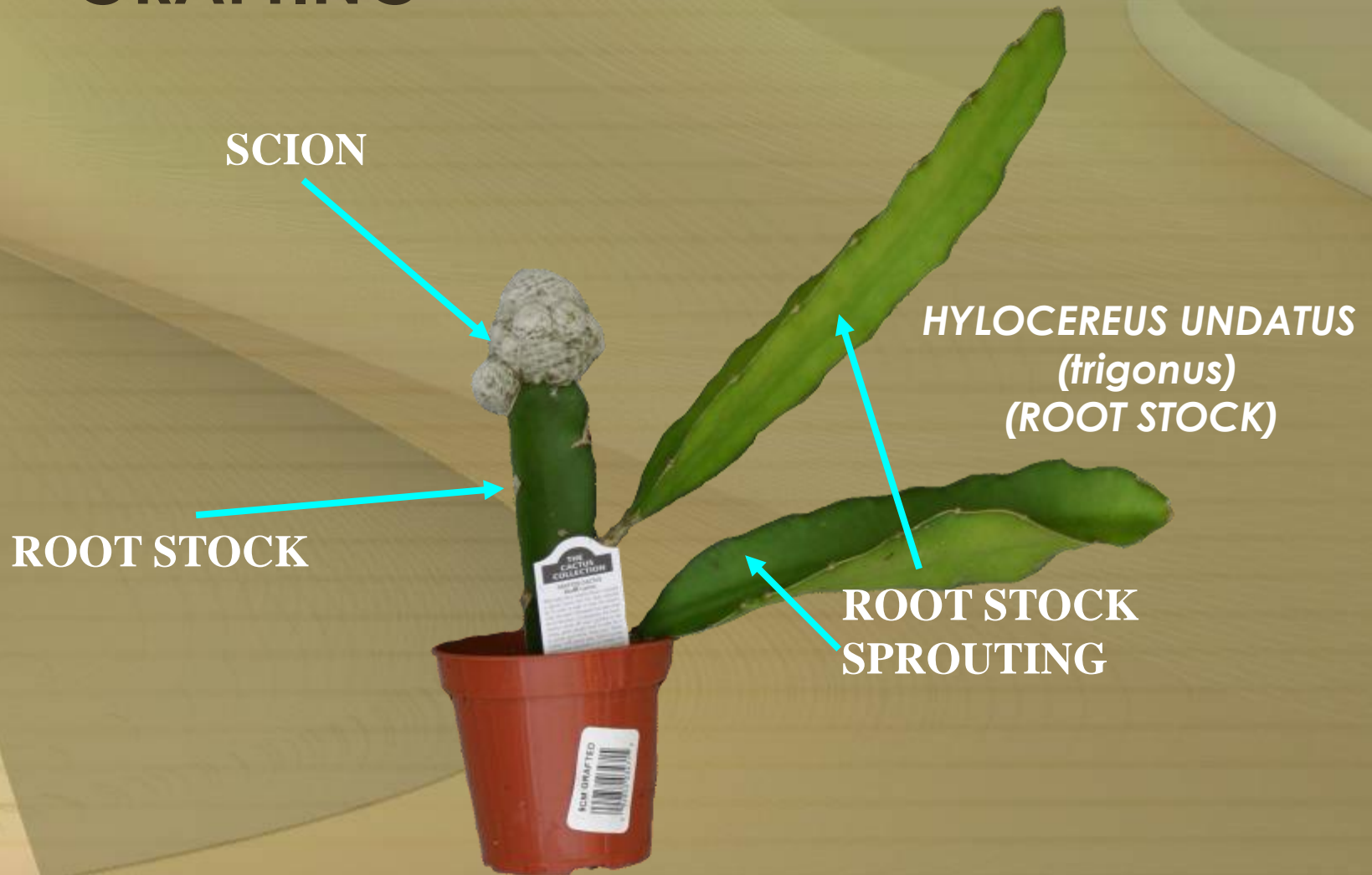
SOME GROWERS SUGGEST THAT THEY BE RE-GRAFTED ON TRICHOCEREUS BEFORE THE SCION AND THE HYLOCEREUS ROOT STOCK SPLIT APART

MOON CACTUSES ARE A JAPANESE MUTANT FORM OF A SOUTH AMERICAN SPECIES WITH NO CHLOROPHYLL



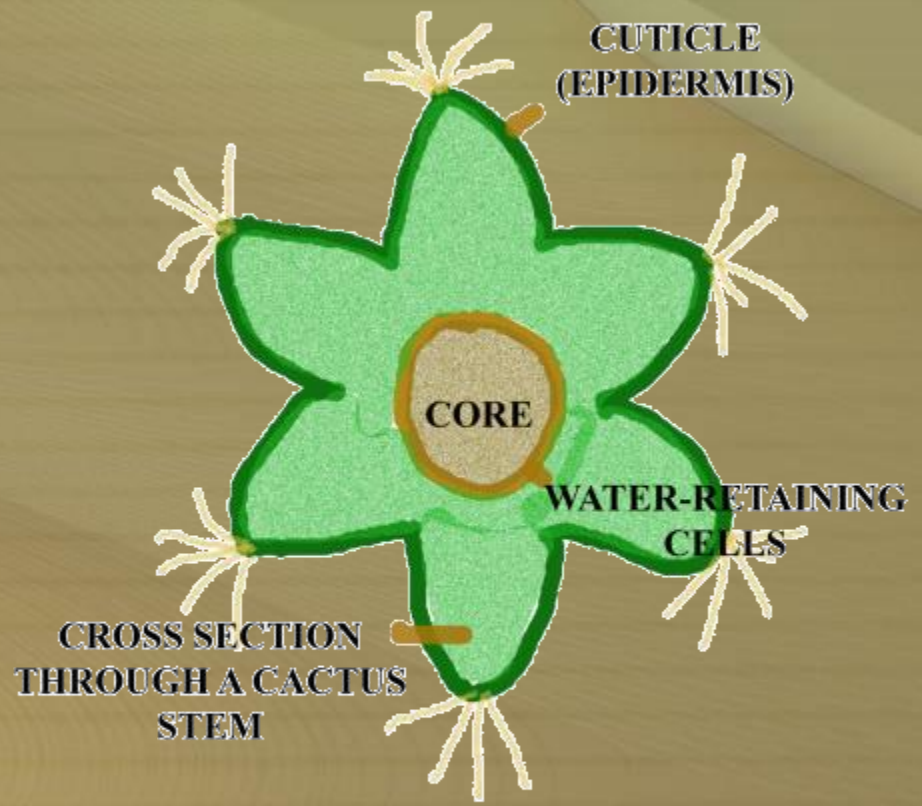
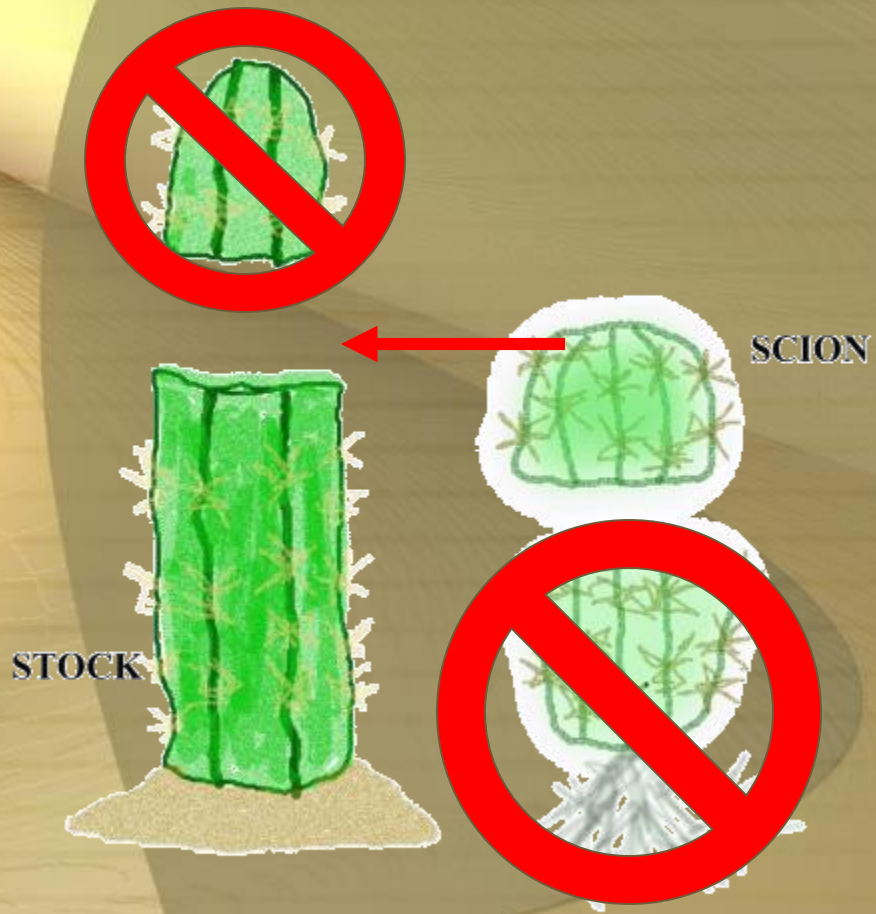
CACTI PROPAGATION

- **GRAFTING**



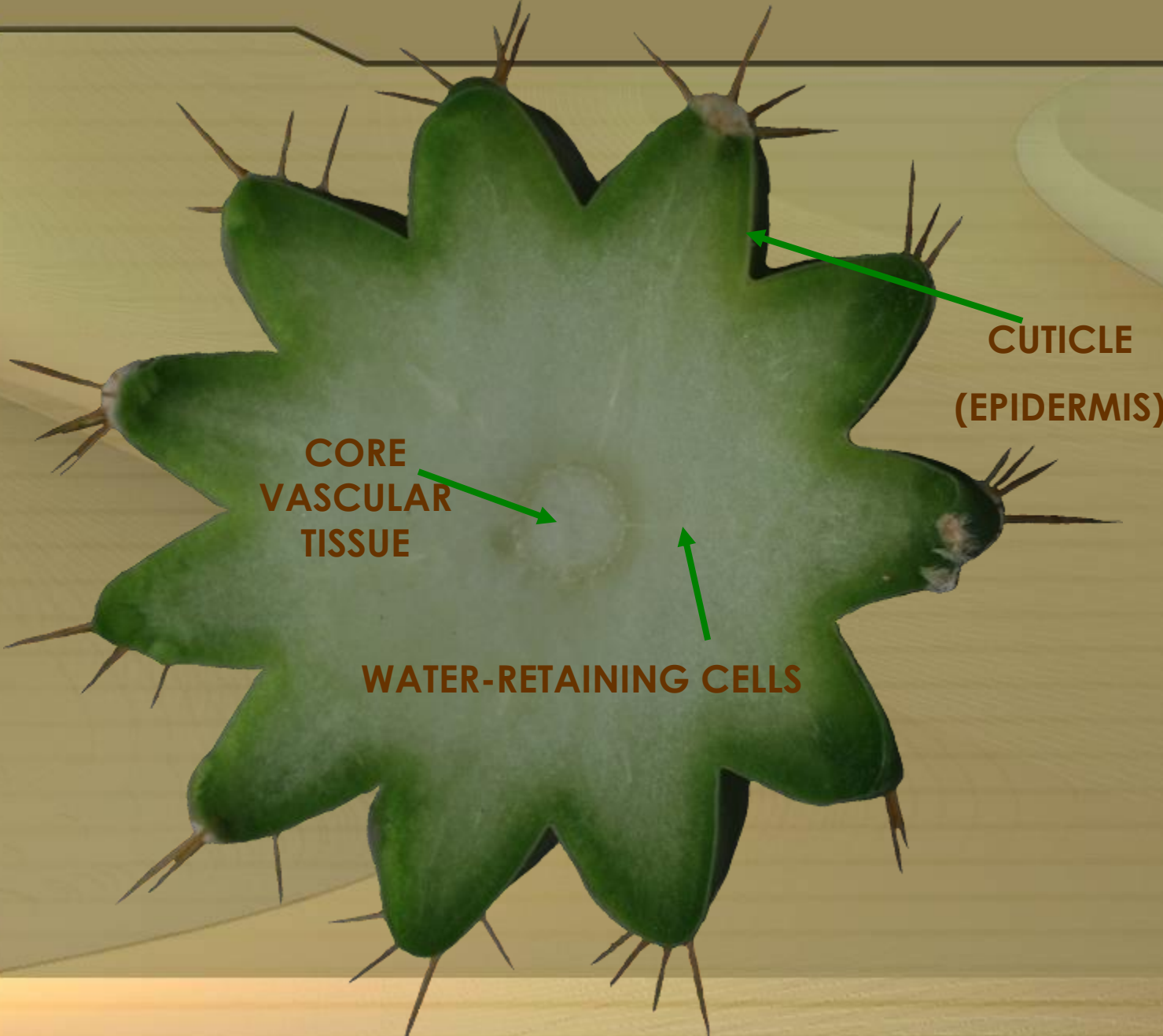
CACTI PROPAGATION

• GRAFTING





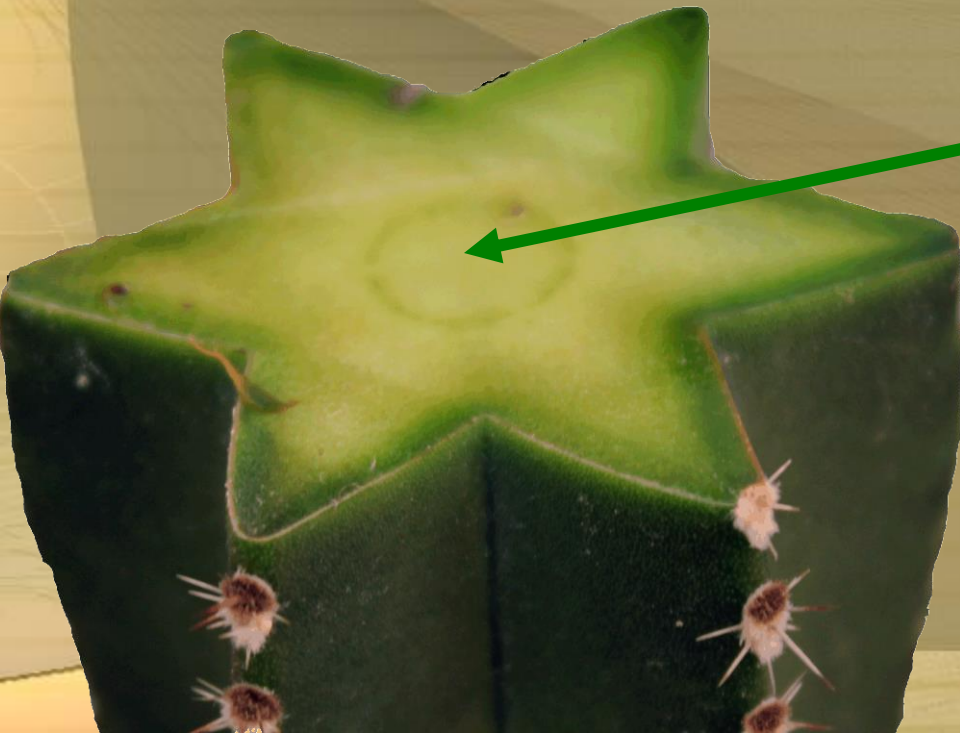
CROSS SECTION THROUGH A CACTUS STEM



GRAFTING A CACTUS



CORE VASCULAR TISSUE



GRAFTING A CACTUS





GRAFTING A CACTUS

**GYMNOCALYCIUM CACTUS
(SCION)**



**PLASTIC BAG GREENHOUSE
FOR HUMIDITY TO SLOW
DRYING OUT OF THE CUT
AREA OF THE ROOTSTOCK**



GRAFTING A CACTUS

SCION DEAD AND ROTTING



PROTECTING THE SCION

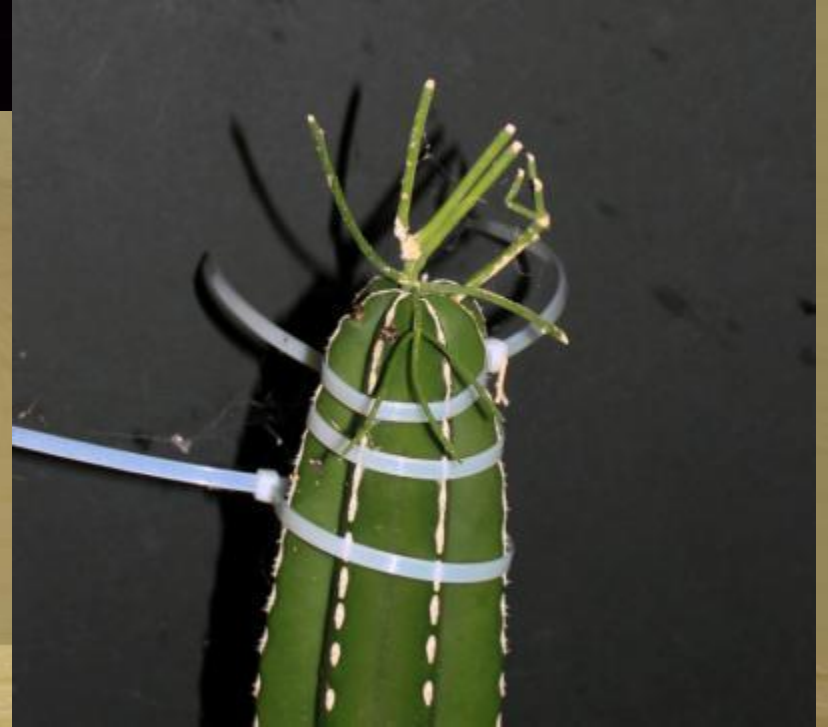




GLUING THE SCION
TO THE STOCK



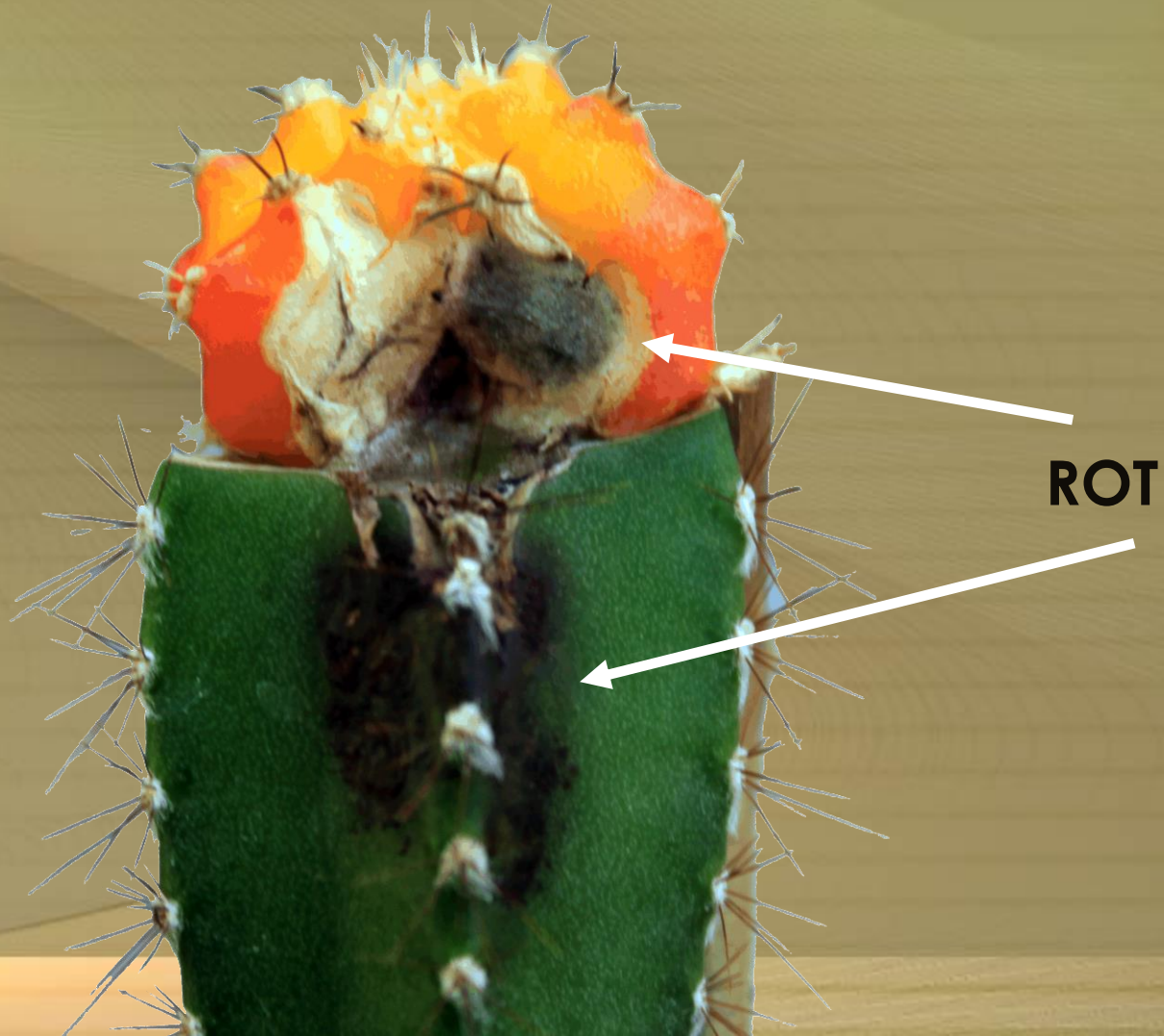
GRAFTING OF CACTUS





GRAFTING A CACTUS

DON'T USE METAL PINS



USING PANTYHOSE TO GRAFT CACTI





GRAFTING A CACTUS



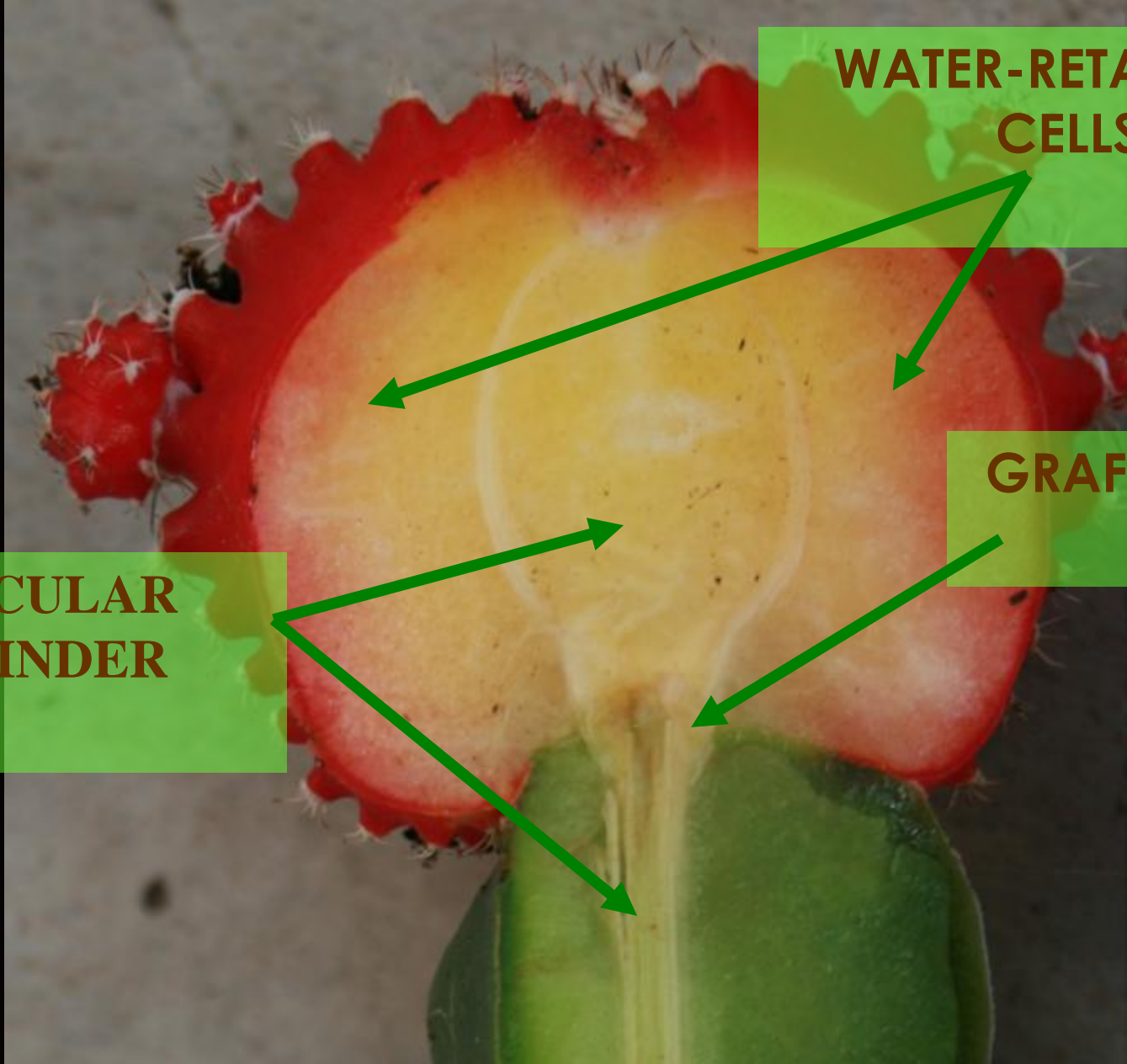
**GROWING
ROOTSTOCK**

***HYLOCEREUS UNDATUS*
(ROOT STOCK)**



NEWLY GRAFTED CACTUS



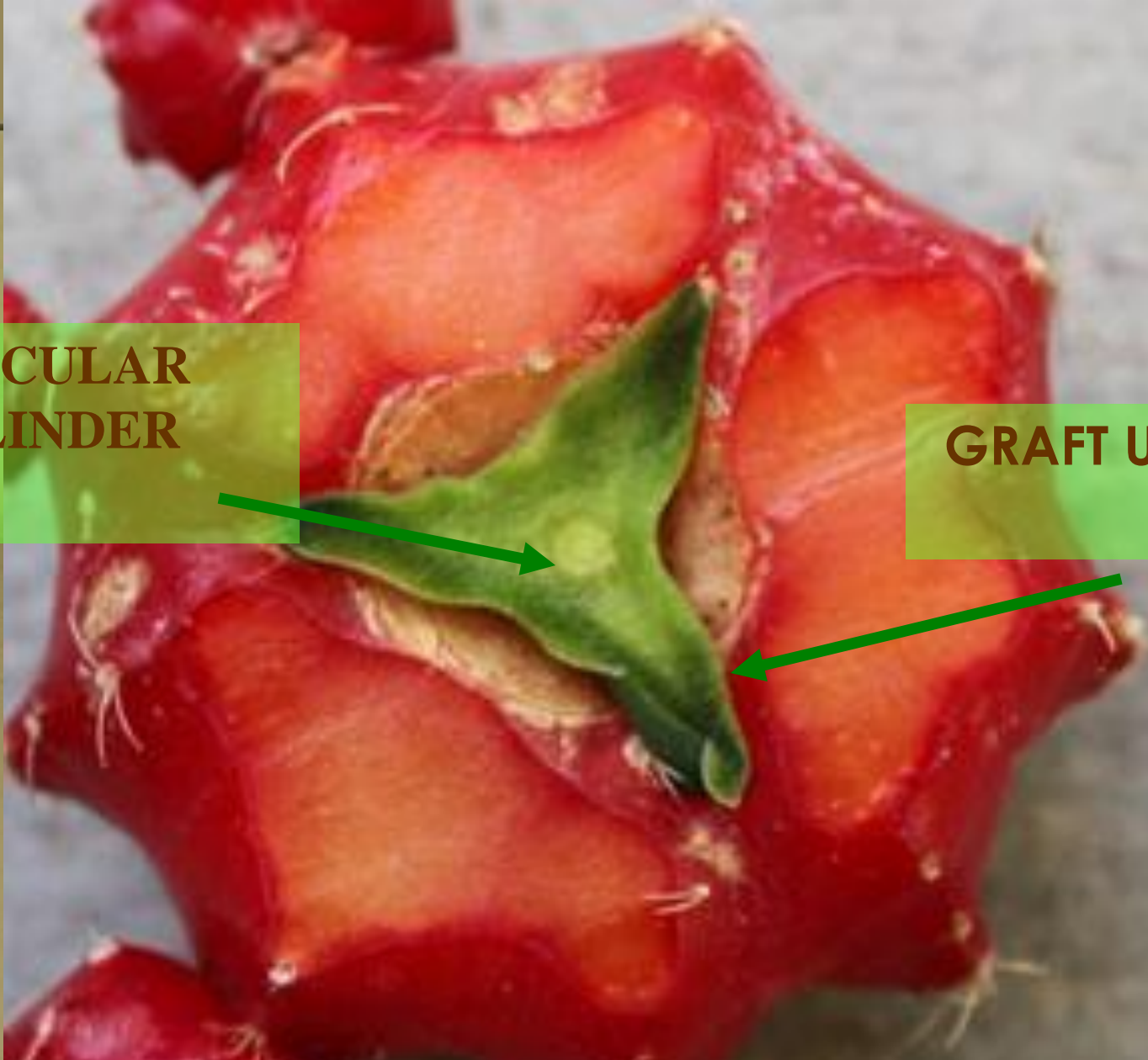


WATER-RETAINING CELLS

GRAFT UNION

VASCULAR CYLINDER

INSIDE A GRAFTED CACTUS



**VASCULAR
CYLINDER**

GRAFT UNION

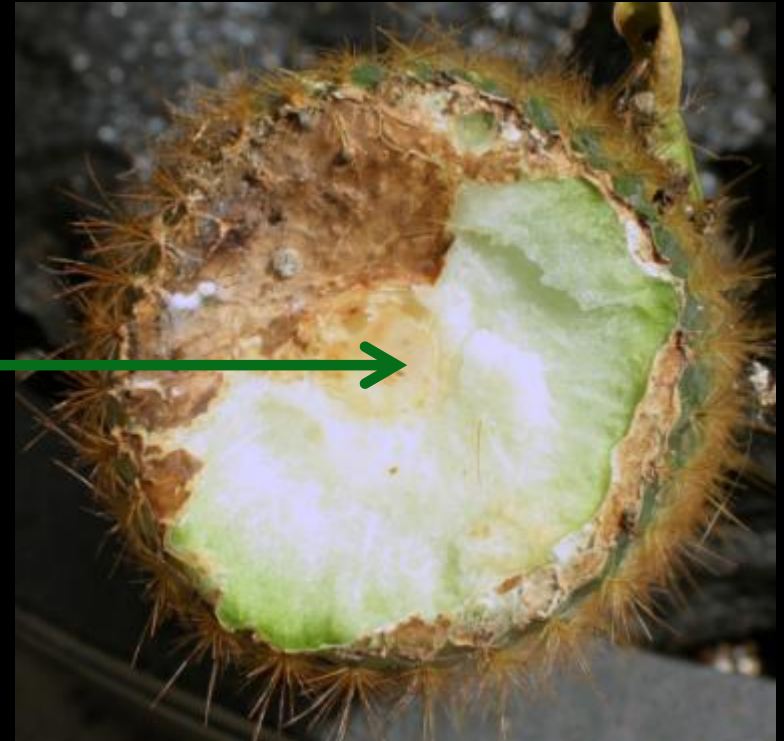
INSIDE A GRAFTED CACTUS



GRAFT UNION



THE LARGER AND STONGER THE ROOT STOCK ,THE LARGER THE SCION WILL GROW



AN OLD GRAFT UNION SHOWING THAT IT WAS NOT FULLY ATTACHED AFTER 3 YEARS



GRAFTING CAN BE FUN



GRAFTING CAN BE FUN



MULTI GRAFTING



Mica Mynatt



central Arizona cactus and s



Maarten VAN DER MEER





PHOTO FROM FACEBOOK



DON'T PLANT GRAFTED CACTI IN THE LANDSCAPE



DEAD IN 3 MONTHS

GRAFTING EUPHORBIAS



GRAFTING EUPHORBIAS



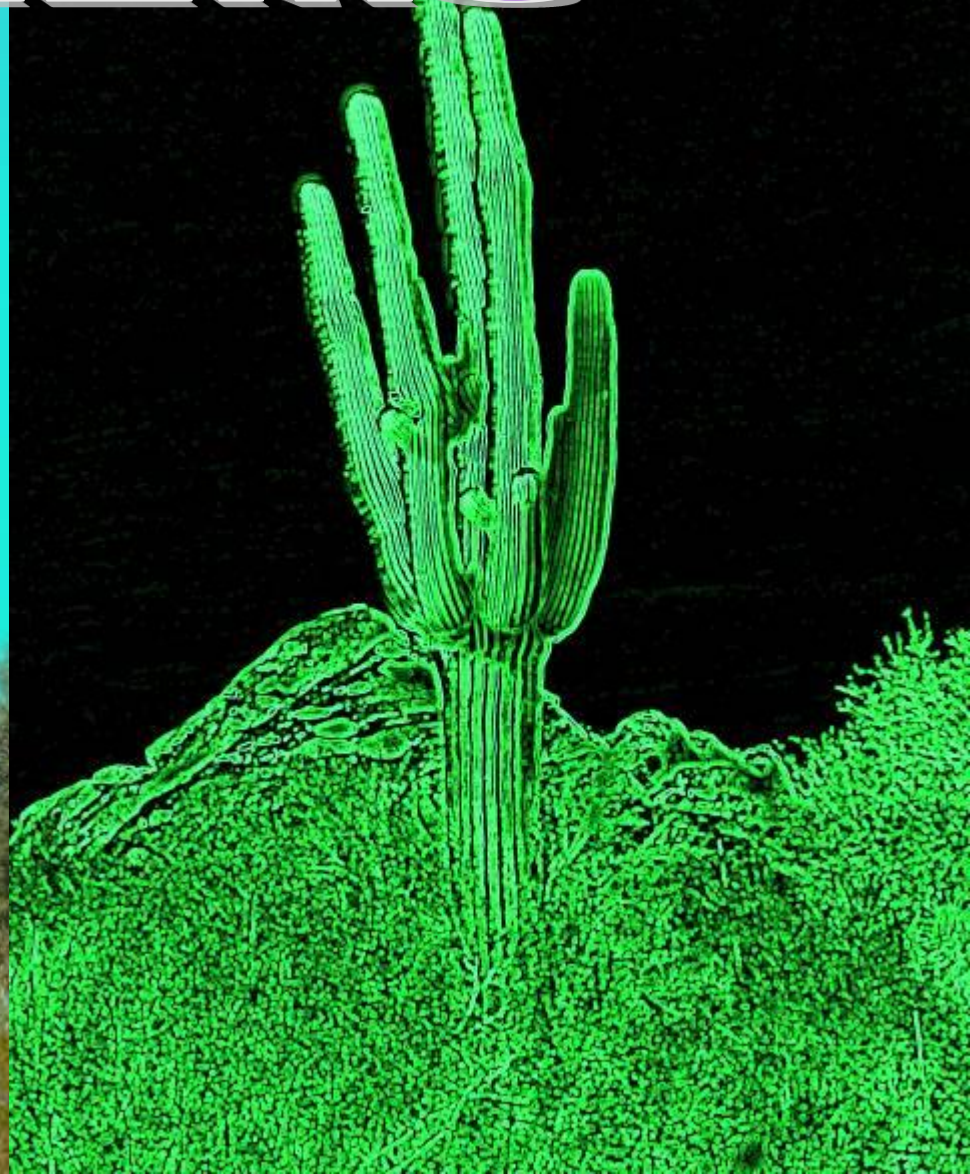
GRAFTING ADENIUMS



GRAFTING ADENIUMS



CACTI PROBLEMS



CACTI PESTS

COCHINEAL SCALE



INSECT THAT ATTACKS
PRICKLY PEAR AND
CHOLLA CACTUS



A SUCKING INSECT



APPEARS AS WHITE COTTON-LIKE SUBSTANCE, RED
LIQUID FORMS WHEN SQUISHED



DON'T GET RED DYE ON CLOTHES



DOES NOT LIKE WET OR COLD CONDITIONS



STRESSED PLANTS ARE LESS RESISTANT



CONTROL



HIGH PRESSURE WASH WITH WATER

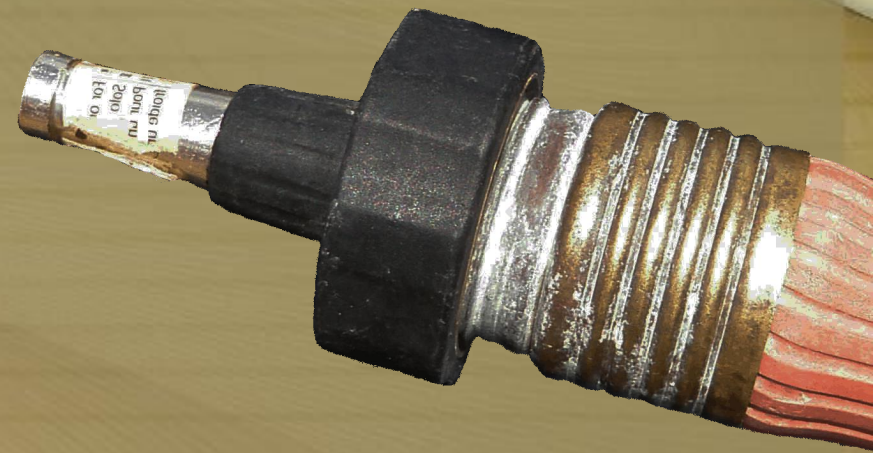




CACTI PESTS

COCHINEAL SCALE CONTROL

- HIGH PRESSURE WASH WITH WATER












CACTI PESTS

A 6 MONTH OLD (STRESSED) CACTUS PAD WREATH
WITH COCHINEAL SCALE



CACTI PESTS

MEALY BUGS

-  A SUCKING INSECT
-  APPEARS AS WHITE COTTON-LIKE SUBSTANCE SIMILAR TO COCHINEAL SCALE (NO RED DYE)
-  CONTROL
-  WASH OFF WITH HIGH PRESSURE WATER
-  INSECTICIDAL SOAP



CACTI PESTS

ANTS



MOSTLY A NUISANCE



**CAN TRANSPORT OTHER PESTS SUCH AS
MEALY BUGS AND SCALE (ANTS FARM
OTHER INSECTS)**

CACTI PESTS

- **MOST ANTS ARE HARMLESS, EXCEPT FOR IMPORTED FIRE ANTS AND HARVESTER ANTS; CONTACT THE DEPARTMENT OF AGRICULTURE IF YOU SEE FIRE ANTS**

CONTROL

- **DIATOMACEOUS EARTH**
- **ANT TRAPS**
- **BOILING WATER ON NEST**
- **FIRE ANT BAIT**

CACTI PESTS

- **PESTS FOUND ON CONTAINERIZED CACTUS (GREEN HOUSE AND INDOORS)**
 - ▣ **THRIPS: SCRAPING AND RASPING OF SOFT STEMS**
 - ▣ **MOST ACTIVE WHEN TEMPERATURE IS 90 F + AND DRY**
 - ▣ **SPIDER MITES:**
 - ▣ **WARM AND DRY**
 - ▣ **FUNGUS GNATS:**
 - ▣ **DRY SOIL**
 - ▣ **INSECTICIDAL SOIL DRENCH**
 - ▣ **WHITEFLIES**
 - ▣ **MEALY BUGS**

Cactus Moth

Cactoblastis cactorum



EGG STICK OF THE CACTUS MOTH

UF

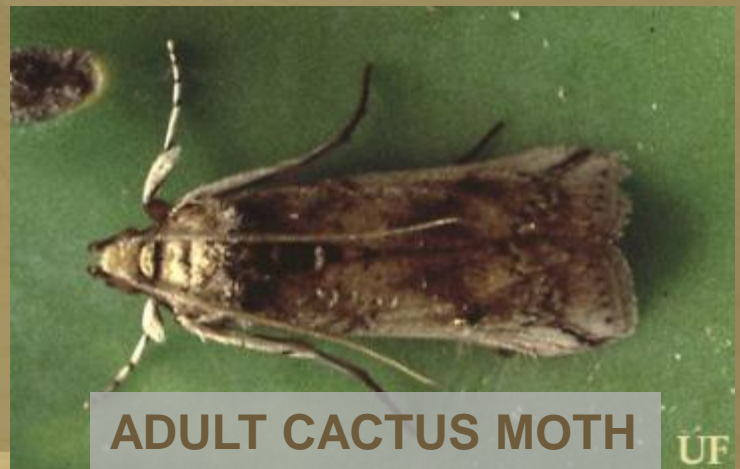


UGA1267056



LARVA OF CACTUS MOTH

UGA1267009



ADULT CACTUS MOTH

UF



FROM SOUTH AMERICA BY WAY OF THE CARIBBEAN, INTRODUCED TO CONTROL OPUNTIA



UGA1267027



UGA1267030

FOUND IN FLORIDA, GEORGIA, SOUTH CAROLINA , ALABAMA; MOVING ACROSS THE COUNTRY

Yucca or Sisal Weevil



- CONTROL
- *GOOD PLANT HEALTH
- *PLANT PEST FREE AGAVES
- *DON'T REPLANT WITH AGAVES AFTER INFESTATION



Agaves that are infested with weevils will wilt.



Inside an Agave that is infested with weevils .





CACTI PESTS

ERIOPHYID MITE ON *ALOE*



PHOTO JACK KELLY U of A



CACTI PESTS

- RABBITS
- MICE
- RATS



CACTI PESTS

- GROUND SQUIRRELS



CACTI PESTS

- **GROUND SQUIRRELS**



CACTI PESTS



CONTROL
• **FENCE**





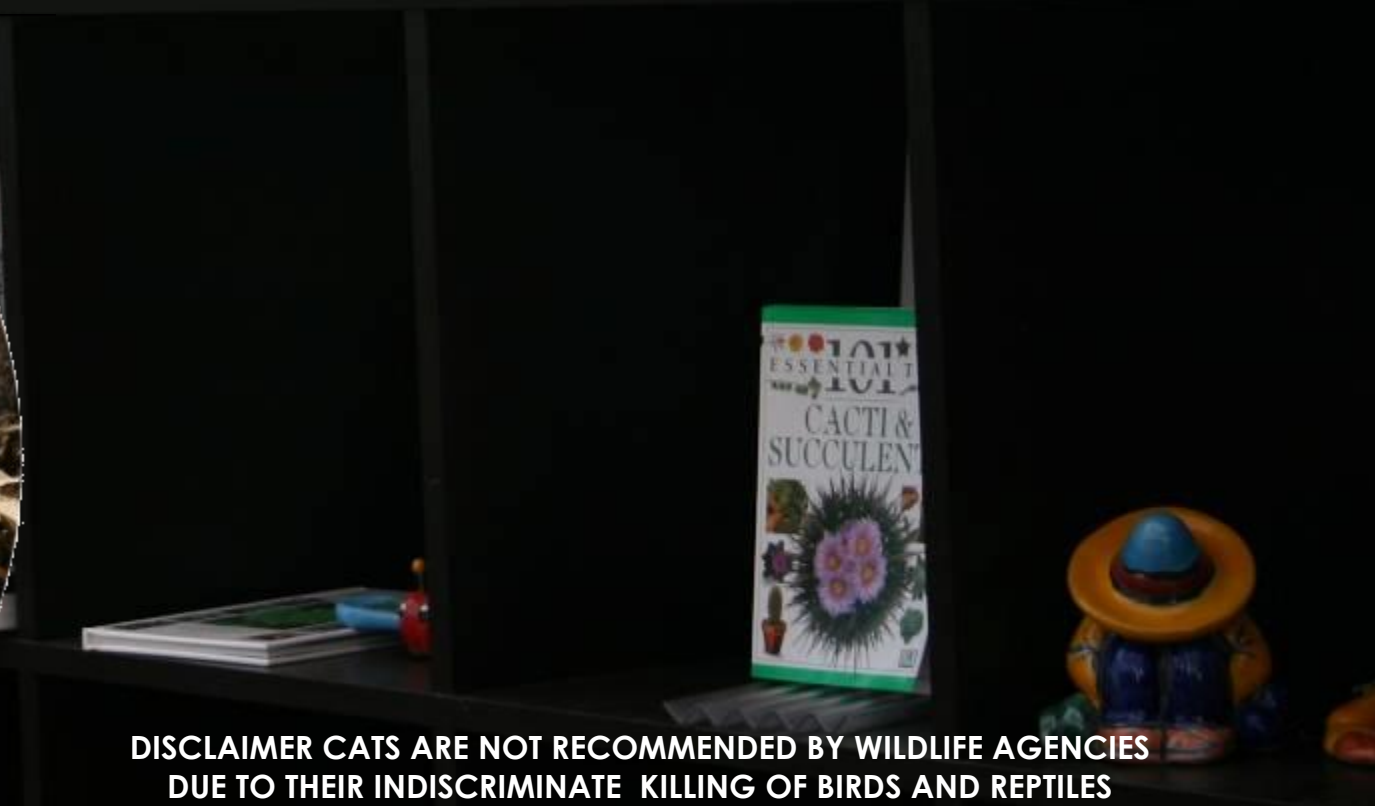
CACTI PESTS



CONTROL FENCE



CONTROL GET A CAT OR COYOTE



**DISCLAIMER CATS ARE NOT RECOMMENDED BY WILDLIFE AGENCIES
DUE TO THEIR INDISCRIMINATE KILLING OF BIRDS AND REPTILES**

CACTI PESTS

- **RING SPOT VIRUS**



PHOTO JACK KELLY U of A

ENGELMANN'S PRICKLY PEAR

CACTI PESTS

- **PHYLLOSTICTA PAD ROT ON PRICKLY PEAR**
(*OPUNTIA SPP.*)



PHOTO JACK KELLY U of A



STEM ROT ON TRICHOCEEREUS





STEM ROT INSIDE

CACTI PESTS





STEM ROT INSIDE

CACTI PESTS



STEM ROT (CACTUS *SPP.*)

**DON'T
OVER
WATER**



**STEM ROT
(EUPHORBIA *SPP.*)**

DON'T OVER WATER





STEM ROT IN A WILD SAGUARO CACTUS



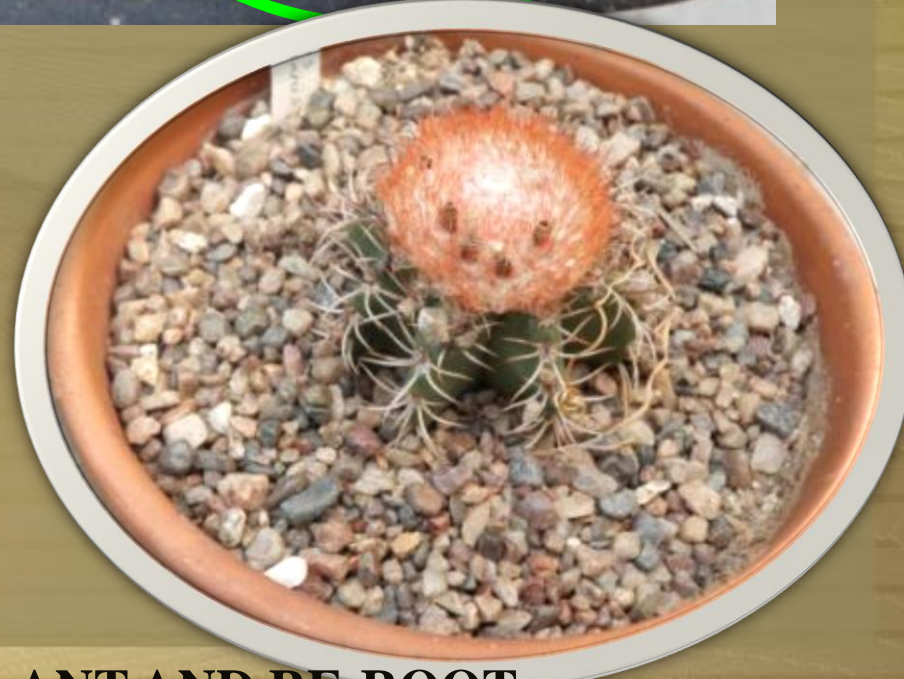
**WATER STANDING
TOO LONG**



STEM ROT



REMOVE THE ROT, LET IT DRY



PLANT AND RE-ROOT



ROT

12 MONTHS

6 MONTHS

REMOVE THE ROT, LET IT REGROW



CACTI PROBLEMS

•COVER NEWLY PLANTED CACTI

•COVER IF TREES THAT SHADE CACTI ARE PRUNED





•SUNBURN

CACTI PROBLEMS

•COVER NEWLY PLANTED CACTI

•COVER IF TREES THAT SHADE CACTI ARE PRUNED





•SUNBURN

CACTI PROBLEMS

•SOFT LEAFED SUCCULENTS WILL BE DAMAGED BY HIGH TEMPERATURES





•SUNBURN

CACTI PROBLEMS

•WHEN THIS TRICHOCEREUS FELL OVER, ITS SHADED SIDE WAS EXPOSED TO THE SUN





CACTUS PROBLEMS

• VARIEGATED OR NUTRIENT DEFICIENCY ?



**GREEN AFTER 1 YEAR
WITH FERTILIZATION**



LOPHOCEREUS SCHOTTII OLD MAN CACTUS



WHY NO SPINES ?



TOO MUCH SHADE ?

CACTI PROBLEMS

COLD, FREEZE DAMAGE

- PLANT ONLY COLD HARDY CACTUS
- PLANT BORDERLINE CACTUS IN PROTECTIVE MICROCLIMATES
- WHEN YOUNG, PROTECT BY COVERING

COLD WET WINTER IN THE WILD





CACTI PROBLEMS

COLD DAMAGE





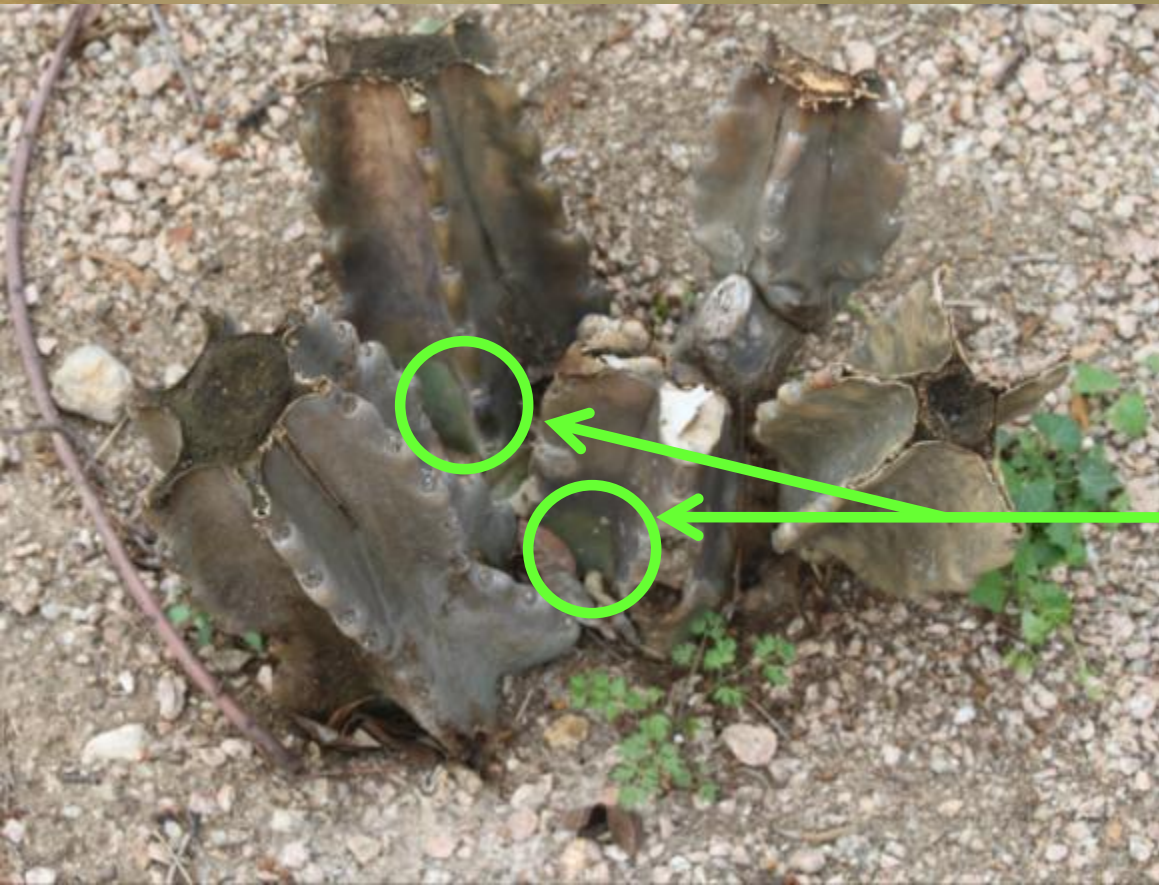
CACTI PROBLEMS

COLD DAMAGE



CACTI PROBLEMS

COLD DAMAGE



**THERE IS STILL
SOME GREEN
(LIVE) AREA AT
THE BASE,
REMOVE ALL
ROTTING DEAD
TISSUE AND WAIT
FOR WARM TO
HOT WEATHER**

COLD PROTECTION



COLD PROTECTION

- **WHEN YOUNG,
PROTECT
BY COVERING**



**TAKE OFF
SOON
AFTER ALL
DANGER OF
COLD IS
PAST**







COLD PROTECTION

- 4 TO 6 DEGREES WARMER INSIDE THAN OUTSIDE



COLD DAMAGE IS THE RESULT OF DURATION (HOW LONG) AND TEMPERATURE (HOW LOW)



COLD PROTECTION

- **STYROFOAM ICE CHEST AND TOMATO CAGES**



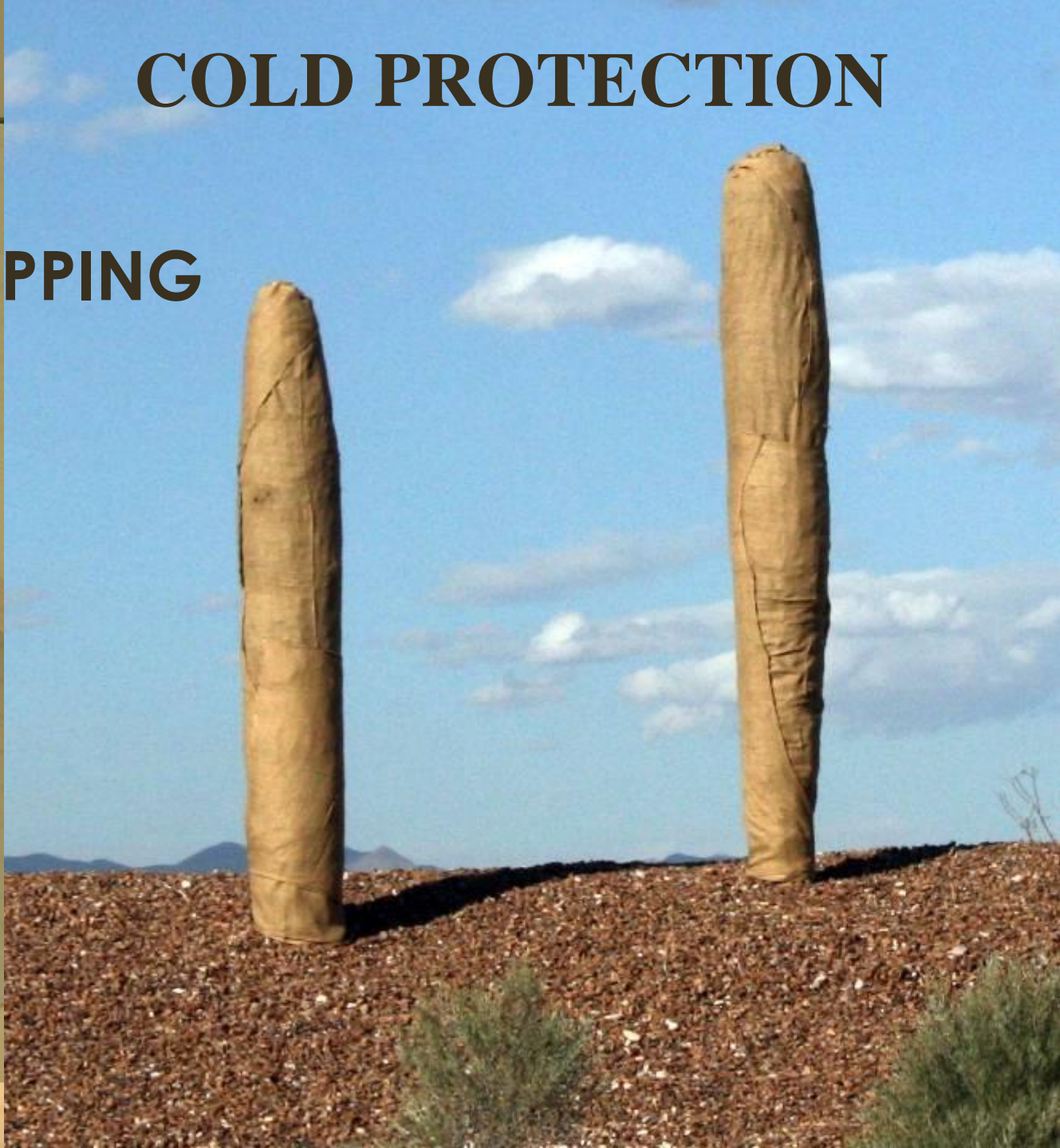
PHOTO BY JAN EMMING





COLD PROTECTION

- **BURLAP WRAPPING**





COLD PROTECTION

- **AGRICULTURAL FROST CLOTH WRAPPING**





POOR COLD PROTECTION





CACTI PROBLEMS

DAMAGED GROWING POINT





**CACTI PROBLEMS
DAMAGED GROWING POINT**

HAIL DAMAGE





**THE BEST COLD PROTECTION
IS TO PLANT ONLY NATIVE
AND NATIVE-LIKE CACTI
THAT GROW WELL IN THE
SOUTHERN NEVADA
CLIMATE**



CACTI PROBLEMS ~~COLD DAMAGE???~~



NO, FIRE

FIRE DAMAGE



CACTI PROBLEMS

ULCERS CAUSED BY DAMAGE FROM RUBBING SPINES



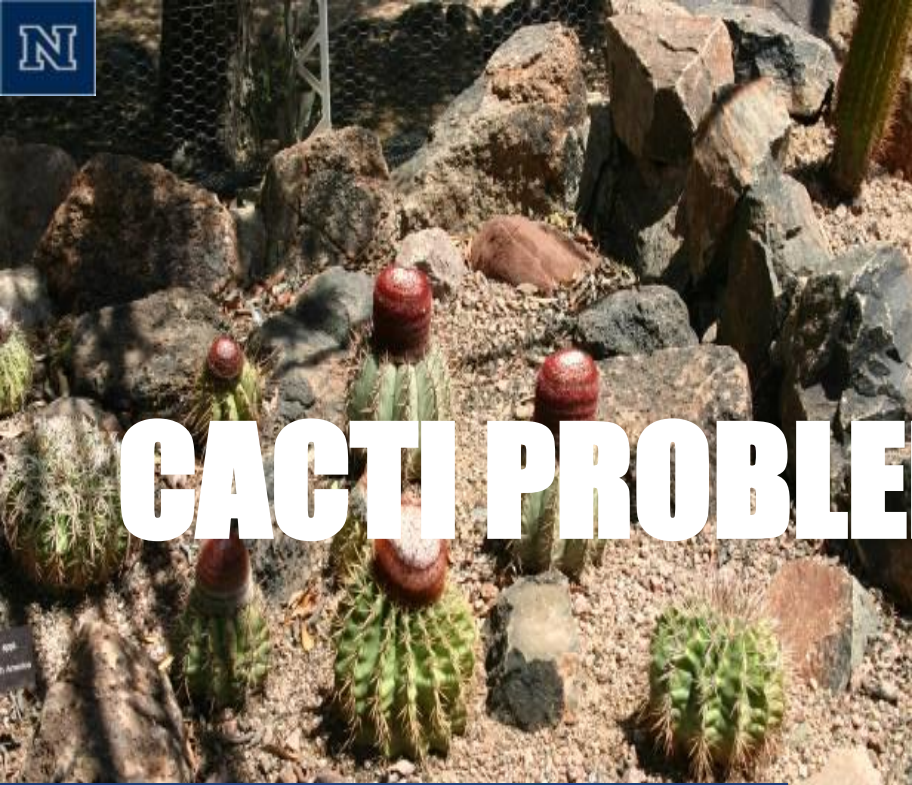
CACTI PROBLEMS

ULCERS CAUSED BY DAMAGE FROM RUBBING SPINES





CACTI PROBLEMS THAT AREN'T





CACTI PROBLEMS THAT AREN'T

WHAT IS THE PROBLEM?

IS THIS CACTUS GRAFTED?

IS THIS A DISEASE?



MATURE GROWTH
ON THIS SPECIES

Melocactus spp.



CACTI PROBLEMS THAT AREN'T

LOPHOCEREUS SCHOTTII
OLD MAN CACTUS



**MATURE GROWTH
ON THIS SPECIES**

CACTI PROBLEMS THAT AREN'T

- FASCIATION





CACTI PROBLEMS THAT AREN'T

- FASCIATION





CACTI PROBLEMS

TRASH IN CACTI





CACTI PROBLEMS

TRASH IN OCOTILLO





CACTI PROBLEMS

DEAD LEAVES AND CACTUS





CACTI PROBLEMS THAT AREN'T

**AERIAL OR ADVENTITIOUS
ROOTS ON CACTI**





CACTI PROBLEMS THAT AREN'T

LICHENS, ALGAE AND MOSS CAN LOOK LIKE A
PROBLEM IN HIGH HUMIDITY AREAS

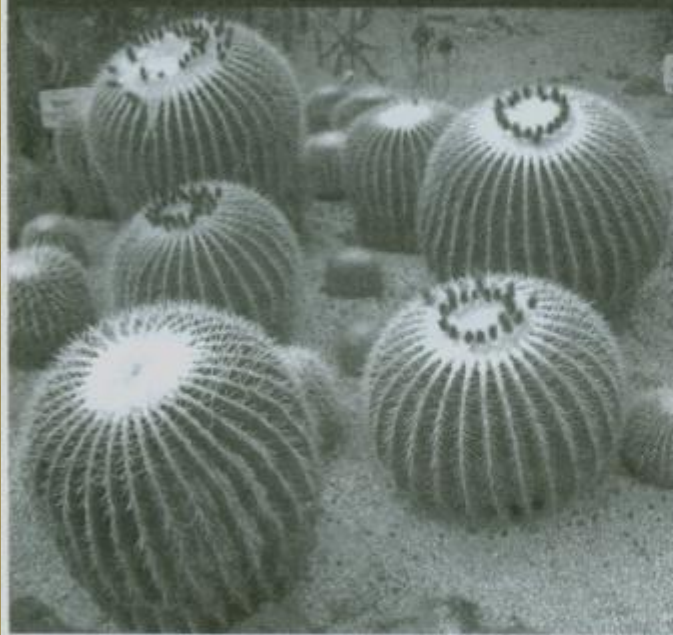


DON'T PAINT CACTI AND SUCULENTS



OTHER CACTI PROBLEMS

Cactus CRIME BUSTERS



have discussed a citywide ban on cacti that have been stolen and put up again in the fall. PHOTO COURTESY

In the city of Palm Desert, Calif., the city's visitor center has a desert garden filled with short, round, spiny plants that are the target of local thieves. These particular plants have been recovered, but \$20,000 worth of golden barrel cacti have been stolen in the last six months.

They are the latest, if somewhat unusual, victims of the economic slide. It started when the economy had peaked and was starting to slow down, says Mr. Spencer Wright, the city's landscape manager. Thieves took the opportunity to take them and sell them for their high resale value.

Police are now taking a zero-tolerance approach. Get caught with a large stolen cactus and you could face up to four years in prison.

One of the rarer and smaller of the barrel cacti, golden barrels, aka "mother-in-law's cushion," can fetch \$100-\$800 on the black market. Mature ones of two feet in diameter can be sold for several thousands of dollars.

Hidden security cameras monitor places where large numbers of the plants are located, and officials will start putting microchips in some cacti, so that stolen ones can be identified.

MODERN CRIME-FIGHTING

LO-JACK FOR CACTI

RADIO TAGS THWART THEFT OF ARIZONA'S ICONIC PLANT

Two thieves could face hundreds of thousands of dollars in fines and possibly years in jail after pulling off one of the highest-profile heists in Arizona history. Their loot: 17 saguaro cacti they uprooted two years ago from Saguaro National Park near Tucson. The 35- to 70-year-old plants each stand five to seven feet tall (saguaros grow to well over 40 feet, but young plants like these are easier to steal) and can fetch \$2,000 apiece from landscapers. "We have an active patrol," says the park's chief ranger, Bob Love. "But we can't be every place all the time." To stop the pillaging, Love and his team will imbed radio-frequency identification tags,

like those used to identify pets, in 1,000 cacti throughout the 91,000-acre park.

With the tags in place, rangers can scan suspicious cacti in truck beds and at nurseries to make sure they weren't pilfered. Ideally, Love says, the mere presence of the tags will deter theft. The tech will also make it easier for scientists to keep track of some of the park's 1.3 million saguaros and record their location, health and growth rate. "The saguaros are an integral part of the Sonoran Desert," Love says. "They provide habitats for a variety of animals and birds. Losing them is a serious problem."

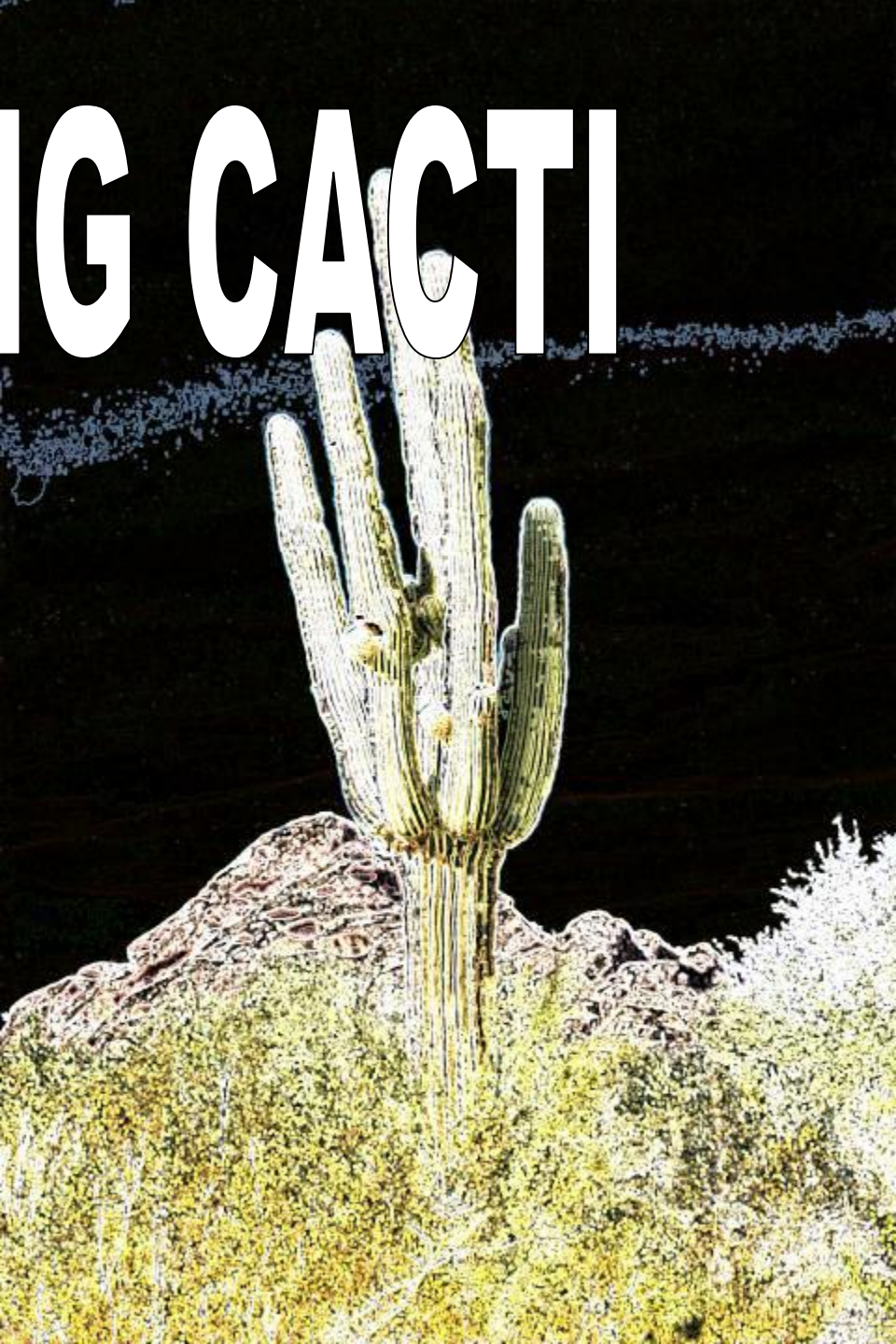
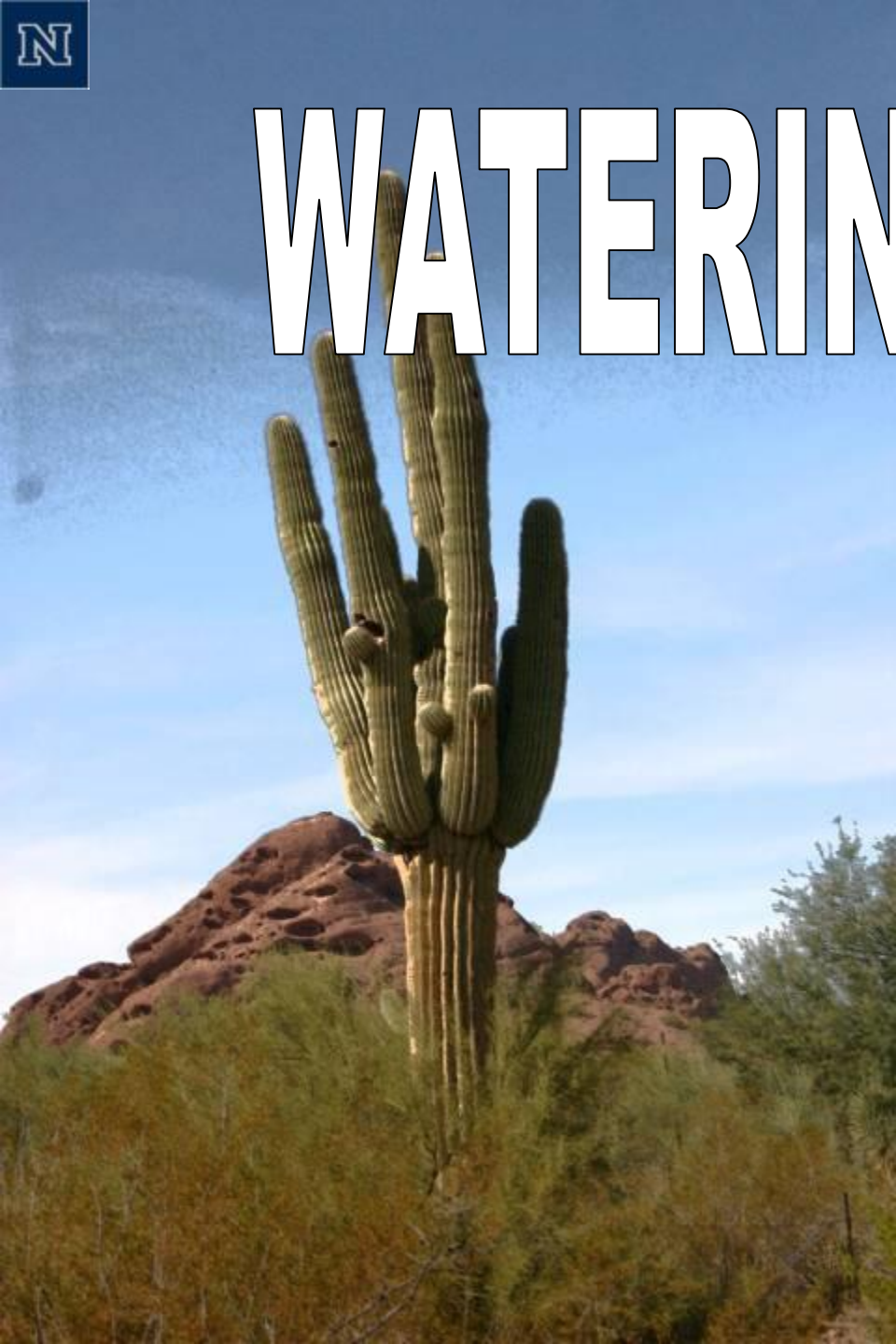
He calculates that the tags and scanners will cost the park around \$5,000. That might sound like a bargain to city officials implementing a similar system in Palm Desert, California, where thieves have made off with 50 barrel cacti and agave plants in the past six months, a haul worth \$20,000. Love still needs to confirm that the chips won't hurt the saguaros, but he expects to begin tagging plants by the end of the year.—COREY BINNS



SAGUARO SAVERS
City officials in Palm Desert have begun injecting radio-frequency ID tags into barrel cacti [above] to prevent theft. Rangers at Saguaro National Park will inject similar tags [right] into their iconic plants [left].



WATERING CACTI





HOW YOU KNOW THAT YOU ARE OVER-WATERING YOUR CACTUS



WATERING CACTI



OVER WATERING (ESPECIALLY IN FALL AND WINTER) IS A MAJOR PROBLEM



WATER ONCE OR TWICE A MONTH OR LESS IN THE WINTER (4-6 WEEKS), 6 TO 12 INCHES DEEP AND 3 FEET OUT ON LARGE CACTI



MOJAVE NATIVES USE LESS WATER



IF TEMPERATURE IS BELOW 105 F ONCE EVERY MONTH, 2 TO 3 WEEKS FOR SMALLER CACTI, AND PRICKLYPEAR OR OPUNTIAS MORE OFTEN



WATERING CACTI



OVER 105 F ONCE EVERY OTHER WEEK



ESTABLISHED NATIVES NEED LITTLE OR NO WINTER WATER



WINTER OVER WATERING CONTRIBUTES TO FREEZE DAMAGE AND ROT



IF IT IS HOT AND THE SOIL DRAINS QUICKLY, IT IS HARD TO OVER WATER



THIS IS TRUE IN THE GROUND AND IN CONTAINERS



IRRIGATION

SUMMER WATERING
EVERY 8 TO 14
DAYS

WINTER ONCE
EVERY 4 TO 8 WEEKS



**OVERHEAD
IRRIGATION**





IRRIGATION IN A WHOLESALE NURSERY





IRRIGATION OF AGAVES






THE ROSETTE OF THE AGAVE CHANNELS WATER TO THE ROOT SYSTEM

THE ARMAMENT PROTECTS THE PLANT FROM ANIMALS SEEKING WATER IN THE LEAVES



WATERING CACTI

-  **UNDER WATERING (SUMMER)**
-  **WATER EVERY WEEK (7-10 DAYS)
SOAKING WELL AND DEEP**
-  **REMEMBER MOST CACTI GROWN IN
NEVADA ARE FROM HIGHER RAINFALL
AREAS THAN THE MOJAVE**



WATERING CACTI

- **TOO LITTLE WATER CAN CAUSE OTHER PROBLEMS**





WATERING CACTI DYING CACTI IN NURSERY FROM POOR WATERING PRACTICES





Small white label on a cactus in a black pot, containing text and a barcode.



WATERING CACTI

- PLANT CACTI WITH PLANTS THAT

• 8 years later





WATERING CACTI

I HAVE A SPLIT PERSONALITY.



HELP ME, I CAN'T GET OUT OF HERE!





WATERING CACTI

ALWAYS GROUP PLANTS WITH LIKE WATER NEEDS



WILLOWS

WILLOWS

OPUNTIA



KEEP EMITTERS AWAY FROM STEMS OF CACTI TO PREVENT ROTTING

STANDING WATER





HOW NOT TO WATER CACTI





WATERING CACTI

NOT ALL CACTI TOLERATE THE SAME AMOUNT OF WATER. THE TWO MINIATURE OPUNTIAS ARE DOING WELL. THE CORYPHANTHA DIED.



USING BERMS FOR WATER HARVEST IN A CACTUS GARDEN



PHOTOS BY JAN EMMING
OF HIS RANCH YUCCA AZ.

USING BERMS FOR WATER HARVEST IN A CACTUS GARDEN



PHOTOS BY JAN EMMING
OF HIS RANCH YUCCA AZ.

LET'S TAKE A SHORT
BREAK





FERTILIZING CACTI



MIRACLE-GRO
COMPAKED MIXTURE
\$ 8.88

FERTILIZING CACTI



MOST DESERT CACTI, ESPECIALLY MOJAVE NATIVES, CAN SURVIVE AND DO WELL WITH LITTLE OR NO FERTILIZER



DO NOT FERTILIZE BEFORE APRIL 15 OR AFTER SEPTEMBER 30



USE AN ORGANIC GRANULAR WITH MINOR ELEMENTS




CACTI RESPOND TO NITROGEN, BUT NEW GROWTH WILL BE 'SOFTER' AND MORE PRONE TO FREEZE DAMAGE AND PEST

- Total nitrogen (N)..... 9%
- 9.00 ammoniacal Nitrogen
- Available phosphate (P₂O₅).....45%
- Soluble potash (K₂O)..... 15%
- Magnesium (Mg) Total 0.10%
- 0.10% water soluble magnesium (Mg)
- Boron (B) 0.0068%
- Copper (Cu) 0.0036%
- chelated copper
- Iron (Fe) chelated iron..... .0.0500%
- Manganese (Mn) chelated mn.....0.0250%
- Molybdenum (Mo)..... 0.0009%
- Zinc (Zn) chelated zinc..... 0.0025%

Jack's Professional 9-45-15 plant Starter liquid

FERTILIZING CACTI

 **EARLY SPRING 1-7-7 RATIO (2-14-14, 4-26-26)**
(POTS) BLOSSOM BUSTER (LIQUIDE IS GOOD) COMPLETE
FERTILIZER) Peter's 9-45-15 Blossom Booster

 **FALL 1-1-1 RATIO (7-7-7, 10-10-10)**
(GRANULAR FERTILIZERS MUST BE
WATERED IN) (POTS)

 **LIQUID 15-30-15 (EVERY 3 TO 4 WEEKS) MIX**
AT ¼ TO ½ THE NORMAL STRENGTH FOR
CONTAINERIZED PLANTS

 **SOME CACTI GROWERS FERTILIZE EVERY**
SECOND OR THIRD TIME THEY WATER IN
HOT WEATHER .

 **EVEN CONTAINERIZED CACTUS CAN DO**
WELL ON THE NUTRIENTS PROVIDED IN
THE POTTING SOIL ALONE

IF YOU REPOT EVERY 3 YEARS OR SO



THE CACTI IN THIS FIELD NURSERY ARE 6 YEARS OLD OR LESS, WERE PLANTED FROM 6 INCH POTS, AND WERE ONLY IRRIGATED NOT FERTILIZED.





CACTI CONTAINER GARDENS

THIS CACTUS WAS IN THE SAME POT FOR MORE THAN 30 YEARS, PLANTED ONLY IN SAND AND RECEIVED NO FERTILIZATION





CACTI CONTAINER GARDENS

HERE ARE SOME
PICTURES OF THE
SAME CACTUS.

(FRONT) THE CACTUS
IS STILL IN THE SAME
POT WHERE IT GREW
FOR MORE THAN 30
YEARS, PLANTED
ONLY IN SAND, NO
FERTILIZATION. (TOP)
THE CACTUS WAS
REPOTTED INTO A
LARGER CONTAINER
WITH NEW SOIL, AND
IS NOW WATERED
REGULARLY.



**PRUNING
CACTI
AND OTHER
DESERT PLANTS**



TREAT YOUR CACTI RIGHT OR THEY WILL TRY TO ESCAPE

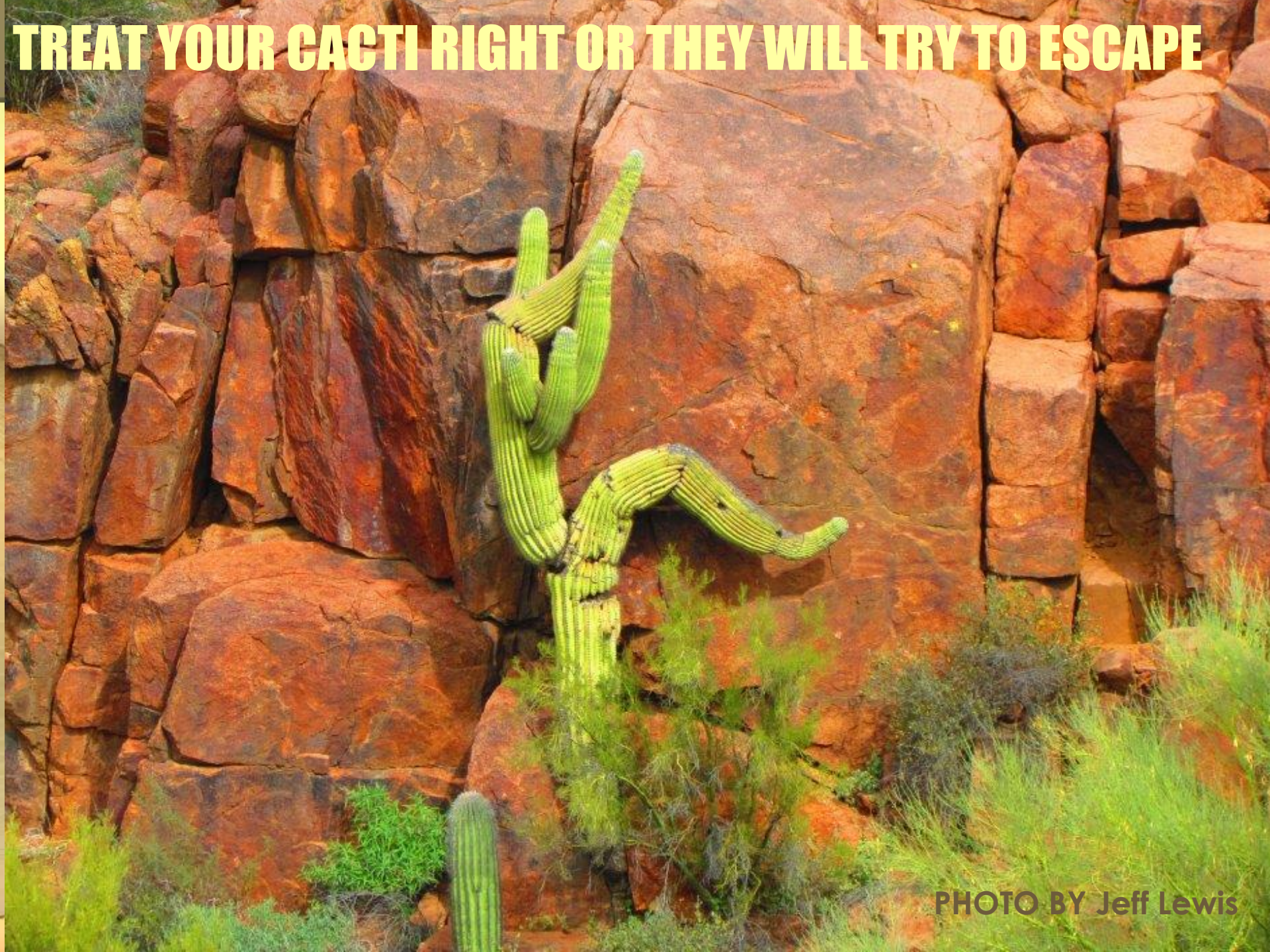


PHOTO BY Jeff Lewis



PRUNING CACTI



POORLY PRUNED





**POORLY
PRUNED**





DON'T TOP CACTI





DON'T TOP CACTI



PRUNING CACTI

ON

rsity to You

NG CENTER

ounty and USD

SPEED
5
MP
LIM





CORRECTLY PRUNED



DASYLIRION
PRUNING
OTHER DESERT PLANTS

PRODUCES EXCESS
LANDFILL MATERIALS





DASYLIRION



OVER PRUNING FOR SOMETHING TO DO ???





OVER PRUNING OTHER DESERT PLANTS

**PRODUCES
EXCESS LANDFILL
MATERIALS**





AGAVES

**OVER PRUNING
OTHER DESERT PLANTS**

ALWAYS WEAR SHOES IN THE CACTUS GARDEN





Photo by Jan Emming yucca AZ

CACTI IN THE LANDSCAPE



CACTI BASICS

- **ALWAYS PLANT IN WELL DRAINED SOILS.**
- **PLANT WITH THE CORRECT SUN EXPOSURE, REMEMBER IN THE DESERT MANY SPECIES DO BETTER IN PARTIAL SHADE (BEST UNDER DESERT TREES).**
- **PLANT DURING THE WARM SEASONS (SPRING TO MID SUMMER) TO ENCOURAGE ROOT GROWTH.**
- **IF ADDING ORGANIC MATERIALS TO PLANTING HOLE ADD 10% OR LESS.**
(NOT RECOMMENDED)
- **MANY NURSERY CACTUS NEED SHADING WHEN PLANTED IN FULL SUN IN THE LANDSCAPE UNTIL ESTABLISHED.**

CACTI BASICS

- **KNOW MATURE SIZE, COLD TOLERANCE, AND WATER REQUIREMENTS; DIFFERENT CACTI HAVE DIFFERENT REQUIREMENTS.**
- **TRANSPLANTED FIELD, NURSERY OR SALVAGED CACTI MUST BE PLANTED WITH THE SAME ORIENTATION.**
- **FIELD DUG CACTI NEED DAMAGED ROOTS TRIMMED AND SHOULD BE DRIED IN THE SHADE A FEW DAYS BEFORE PLANTING.**
- **DON'T PLANT HEAVILY ARMED CACTI NEAR PEDESTRIAN AREAS.**

CACTI BASICS

- **PLANT IN A SHALLOW, WIDE PLANTING HOLE.**
- **WATER WELL AND SET IRRIGATION SCHEDULE. LET CACTI DRY OUT BETWEEN WATERINGS.**
- **MULCH ONLY WITH INORGANIC MATERIALS SUCH AS DECOMPOSED GRANITE (DG) AND OTHER ROCK MULCH, NEVER WITH ORGANIC MULCHES.**



CACTI IN THE LANDSCAPE



CACTI IN THE LANDSCAPE





CACTI IN THE LANDSCAPE





CACTI IN THE LANDSCAPE





CACTI IN THE LANDSCAPE





CACTI IN THE LANDSCAPE





CACTI IN THE LANDSCAPE





CACTI IN THE NATURAL LANDSCAPE





CACTI IN THE NATURAL LANDSCAPE





CACTI IN THE NATURAL LANDSCAPE



WHEN CACTI PLANT THEMSELVES



WHEN CACTI PLANT THEMSELVES



PLANTING CACTI GREEN ROOF



PLANTING CACTI GREEN ROOF





CACTI AS THE PREDOMINANT LANDSCAPE PLANT





CACTI IN THE LANDSCAPE USE REAL CACTI IN THE DESERT



USE SOME IMAGINATION NOT JUST ROCKS AND 15 GOLD BARREL CACTUS







CACTI AS FENCES IN THE LANDSCAPE



CACTI AS A HEDGE OR FENCE



CACTI AS FENCES IN THE LANDSCAPE



SECURITY BORDER ALONG A WALL







**PLANT CACTI
WITH OTHER
DESERT
PLANTS THAT
HAVE SIMILAR
NEEDS**







MIXED PLANTING





COLORADO SUNSET



MANDARIN SUNRISE

RE-BLOOMERS BLOOMING EVERY 4 TO 5 WEEKS IN THE SUMMER



PEACH PIE



GARNET GLOW



HAWAIIAN PUNCH



CHOCOLATE PRINCESS

RE-BLOOMERS BLOOMING EVERY 4 TO 5 WEEKS IN THE SUMMER



RUFFLED PAPAYA



BOULDER GARDENS

SOME DESERT PLANTS GROW BEST IN MICROHABITATS AROUND BOULDERS

BOULDER MICROHABITATS PROVIDE

- PLACES WHERE SOIL AND MOISTURE ACCUMULATE**
- SHADY, COOL AREAS ON THEIR NORTH SIDE**
- SUNNY, WARM AREAS ON THEIR SOUTH SIDE**
- PROTECTION FROM FORAGING WILDLIFE**

BOULDER GARDEN



**PLANT CACTI AND OTHER
SUCCULENTS SO THE SOIL
DRAINS QUICKLY**



**PLANT TREES AND
SHRUBS IN BASINS TO
HARVEST MORE WATER**

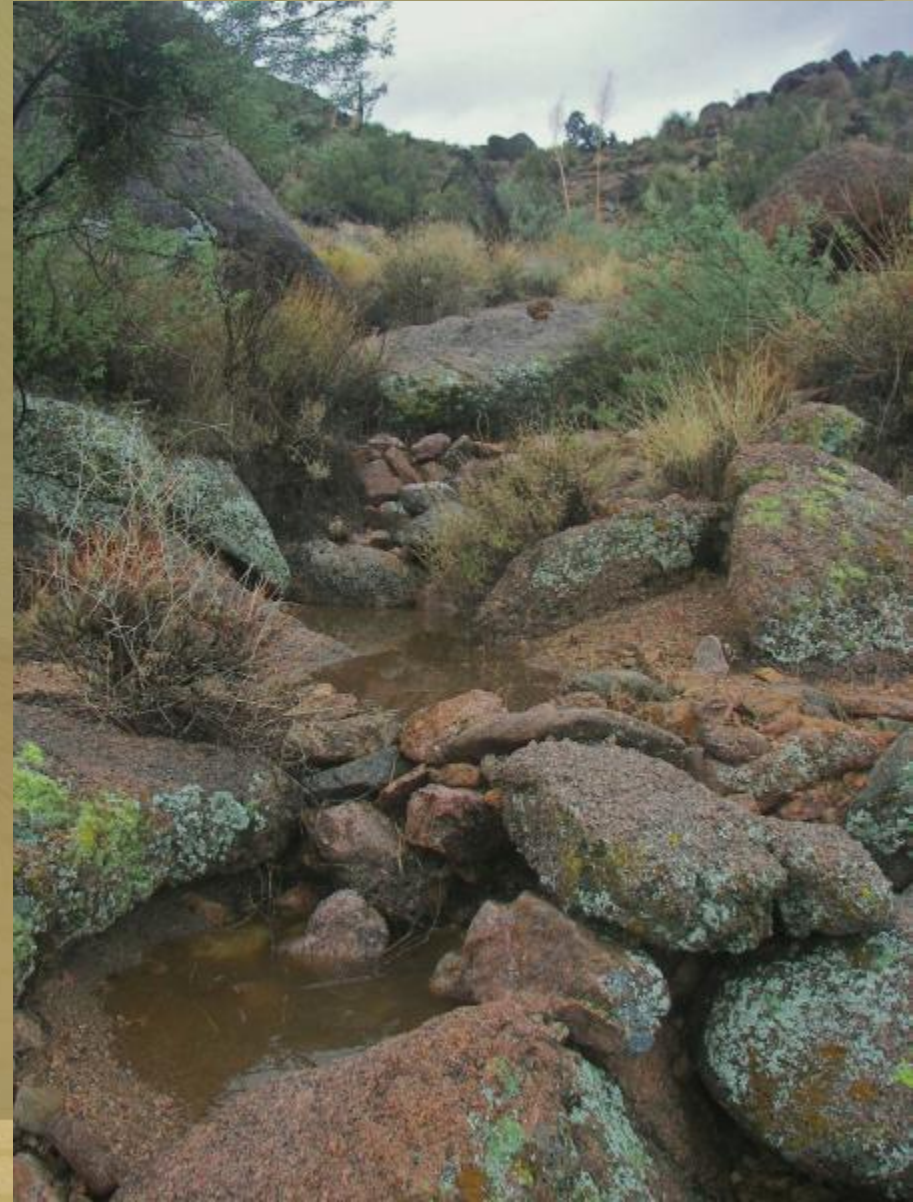


BOULDER GARDEN



**RAINWATER IS
CAPTURED ON THE
SURFACE OF ROCKS,
PROVIDING MORE
WATER FOR PLANTS**

USING ROCKS FOR WATER HARVEST IN A CACTUS GARDEN



PHOTOS BY JAN EMMING OF HIS RANCH YUCCA AZ.

GROWING CACTI IN CONTAINERS



GROWING CACTI IN CONTAINERS



CHOOSE VARIETIES THAT WILL NOT OUT GROW THE CONTAINER QUICKLY



CACTI NEED GOOD AIR CIRCULATION



WELL DRAINED SOIL (SEE CACTUS MIXES)



CHOOSE CONTAINERS THAT DRAIN QUICKLY (CLAY IS THE BEST, BUT DISINTEGRATES BECAUSE OF THE POOR QUALITY OF SOUTHERN NEVADA'S WATER)

GROWING CACTI IN CONTAINERS



LIGHT: NOT ALL CACTI (ESPECIALLY IN CONTAINERS) DO WELL IN FULL SUN IN THE DESERT



FERTILIZE WITH SLOW RELEASE OR LIQUID FERTILIZERS



UNDER POT TO HELP CACTI DRY OUT BETWEEN WATERINGS

GROWING CACTI IN CONTAINERS

 CHOOSE THE BEST LOCATION FOR THE SPECIES BEING GROWN, MOST OF THE TIME THAT WILL BE PARTIAL SUN

 PLANT SLIGHTLY HIGH IN THE CONTAINER FILLING THE REST WITH PEA GRAVEL OR SIMILAR ROCK MULCH

 REPOT EVERY 3 TO 5 YEARS



GROWING CACTI IN CONTAINERS



LEACH OUT SALTS BY WATERING 15% TO 20% MORE THAN THE CONTAINER CAN HOLD



SOIL (SEE CACTUS MIXES)



REPOT AS NEEDED



REPOT WHEN SOIL IS DRY TO PREVENT ROOT DAMAGE



**DAMAGED ROOTS SHOULD DRY A FEW DAYS BEFORE
POTTING**



USE NEW SOIL



CLEAN TOOLS



CLEANED OR NEW POTS



CACTI IN CONTAINERS



CACTI IN CONTAINERS

INDOOR PROBLEMS



TOO LITTLE LIGHT FOR GOOD GROWTH



PESTS SUCH AS MEALY BUGS, SPIDER MITES, AND SCALE



OVER WATERING/ UNDER WATERING



TOO MUCH ARMAMENT IN LIMITED AREA, ESPECIALLY WITH PETS AND SMALL CHILDREN



CACTI IN CONTAINERS-INDOOR PROBLEMS



POOR LIGHT





CACTI IN CONTAINERS





CACTI IN CONTAINERS





CACTI IN CONTAINERS





CACTI IN CONTAINERS





CACTI IN CONTAINERS





CACTI IN CONTAINERS



CACTI IN CONTAINERS

TREE DWELLING
AND CLIMBING
CACTUS



5 YEARS LATER



5 YEARS LATER





**CACTUS MAKE GREAT HANGING
BASKETS IN THE DESERT
SOUTHWEST SUCH AS THIS
COLLECTION**





EUPHORBIA HAIR



**TREE DWELLING AND CLIMBING
CACTUS**

CONTAINERS







CACTI AND SUCCULENTS IN CONTAINERS

**VARY LARGE
CONTAINERS**





CACTI AND SUCCULENTS IN CONTAINERS



CACTI REFLECTIONS IN THE LANDSCAPE











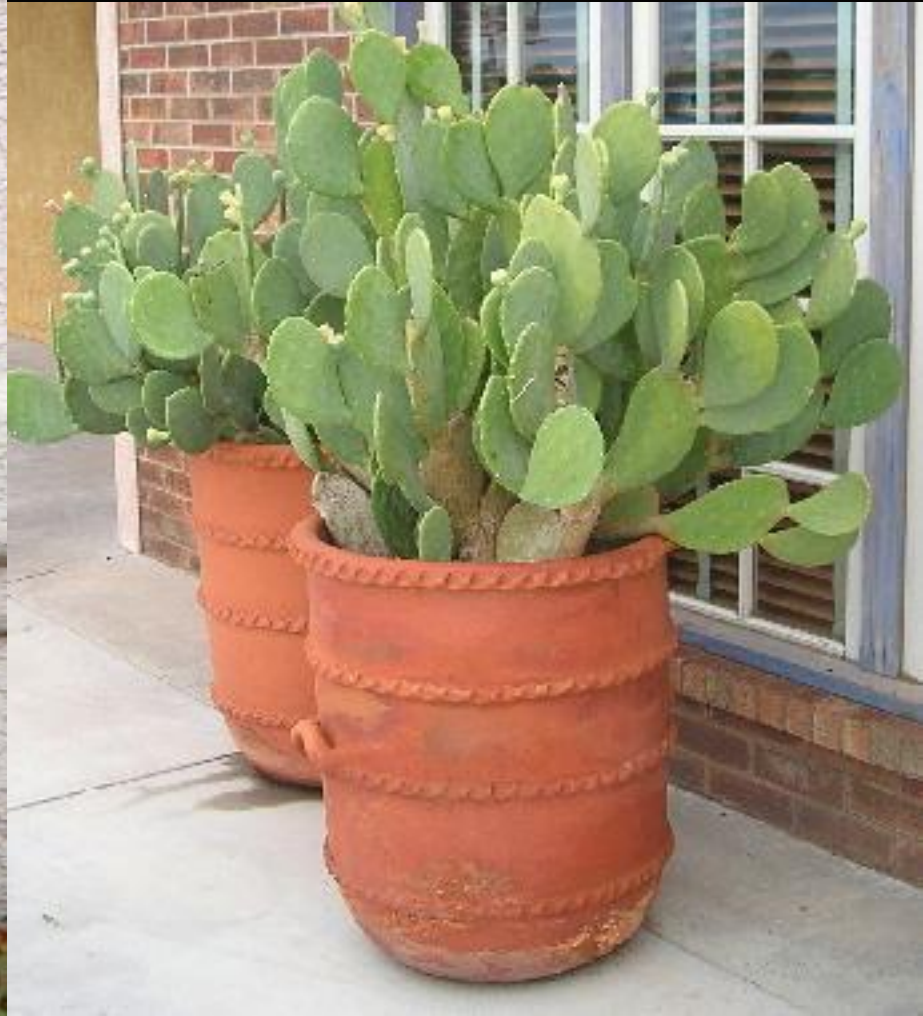




CACTI AND SUCCULENTS IN CONTAINERS



CACTI AND SUCCULENTS IN CONTAINERS













CACTI CONTAINER GARDENS

- CONTAINER PLANTS



**MAKING A
CACTUS DISH
GARDEN**



MIXES FOR CACTI

GROWING AND ROOTING MEDIUM



1/3 PEAT PERLITE

1/3 PUMICE

1/3 SAND

OR



1 /2 PEAT PERLITE

1 /2 PUMICE



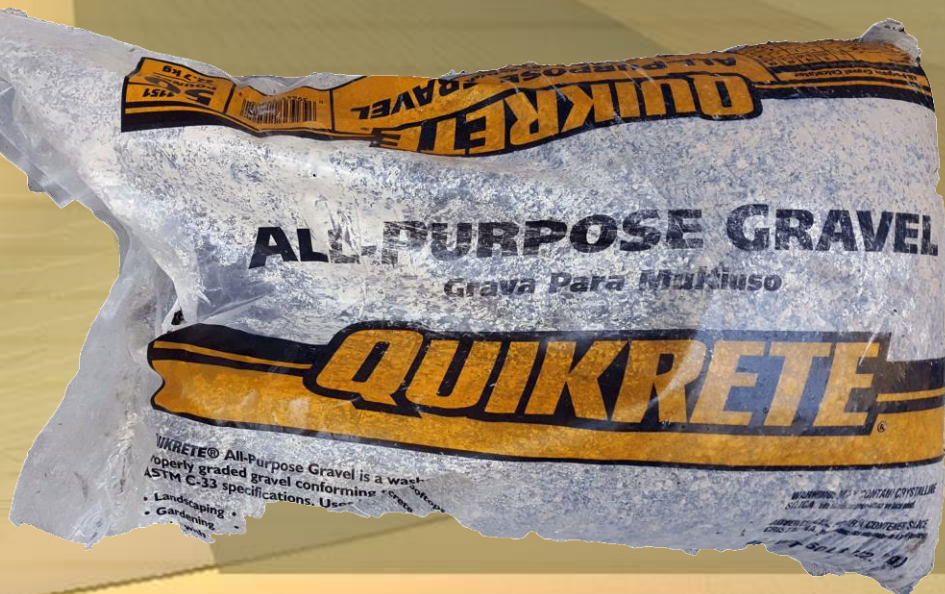


MIXES FOR CACTI

GROWING AND ROOTING MEDIUM



PREFERRED 50 TO 75 % SAND AND SMALL ROCK AND 25 TO 50% ORGANIC POTTING MIX







\$3.97
Everyday
Low
Price



CACTI CONTAINER GARDENS





CACTI CONTAINER GARDENS



REPOT EVERY 3 TO 5 YEARS

THREE YEARS' GROWTH





CACTI CONTAINER GARDENS

CACTUS IN A POT
FOR MORE THAN
30 YEARS





SUPPORTING NEWLY PLANTED CACTI





OTHER WAYS TO USE SUCCULENTS





OTHER WAYS TO USE SUCCULENTS





OTHER WAYS TO USE SUCCULENTS





OTHER WAYS TO USE SUCCULENTS





OTHER WAYS TO USE SUCCULENTS





OTHER WAYS TO USE SUCCULENTS





A CACTUS WREATH FOR A SOUTHWEST HOLIDAY





A CACTUS WREATH FOR A SOUTHWEST HOLIDAY





OTHER WAYS TO USE SUCCULENTS





OTHER WAYS TO USE SUCCULENTS

GREEN DOGS





HOLIDAY TREE



SALVATORE CACCIOLA FROM
FACEBOOK



WATERLESS FOUNTAIN





WATERLESS FOUNTAIN





WATERLESS WATERFALL



8 months



CACTI IN THE NURSERY





CACTI IN THE NURSERY



**BROWN
STRAWFLOWERS**

4oz/132ml

PAINTED CACTI SUCCULENTS IN A NURSERY





CACTI IN THE NURSERY



**DAMAGED OPUNTIA PADS
IN NURSERY**



CACTI IN THE NURSERY





CACTI IN THE NURSERY





CACTI IN THE NURSERY



WHOLESALE FIELD NURSERY





CACTI IN THE NURSERY

- BARE ROOT PLANTS





CACTI IN THE NURSERY



- BARE ROOT PLANTS





CACTI AND SUCCULENTS IN AN INTERIOR NURSERY





CACTI AND SUCCULENTS IN AN INTERIOR NURSERY



SHIPPING CACTI





MAIL ORDER CACTI





SHIPPING CACTI



TOOLS TO CARRY WITH YOU WHEN YOU



TOOLS TO CARRY WITH YOU WHEN YOU TRAVEL





SOME OTHER DESERT PLANTS TO GROW WITH CACTI

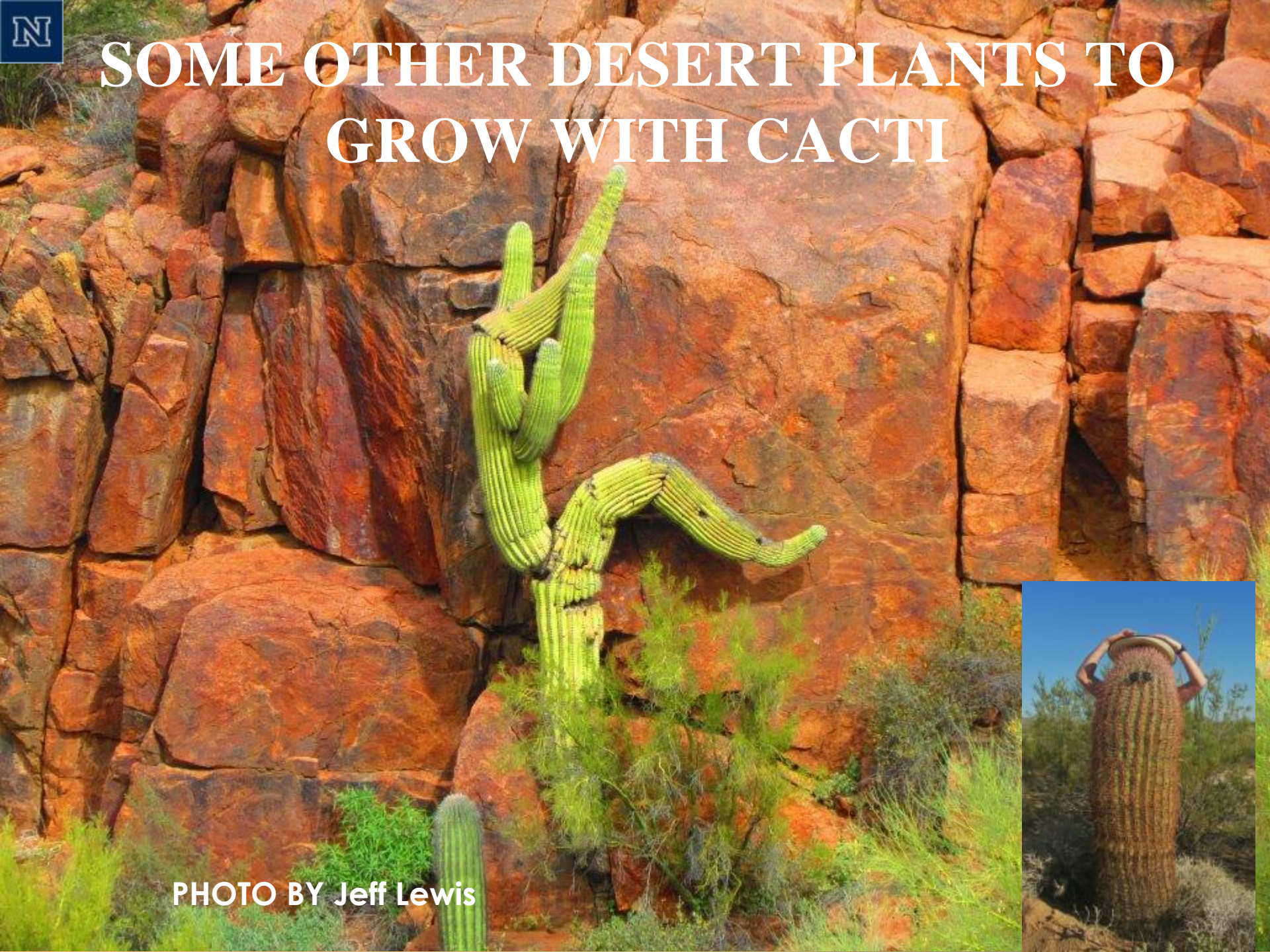







PHOTO BY Jeff Lewis



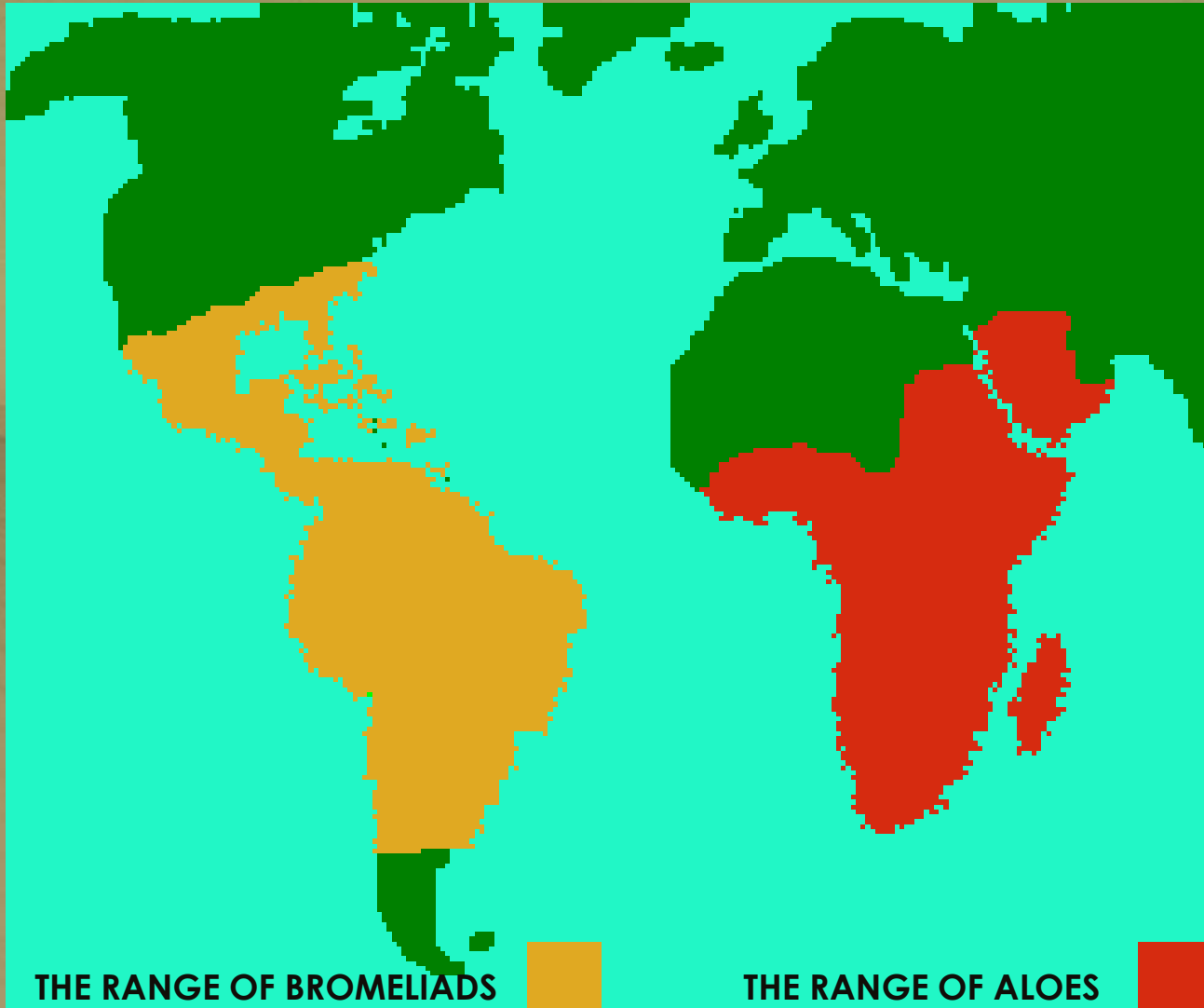
ALOES

-  **OVER 300 SPECIES**
-  **BLOOM EVERY YEAR**
-  **LILY FAMILY**
-  **FOUND FROM ARABIA TO SOUTH AFRICA**
-  **ALOE HAS BEEN USED FOR MORE THAN 3500 YEARS TO HEAL , MOISTURIZE AND AS A SUN SCREEN**



CONVERGENT EVOLUTION

UNRELATED ORGANISMS EVOLVED WITH SIMILAR TRAITS IN SIMILAR ENVIRONMENTS





ALOE SP.

Aloe dorotheae



Aloe vanbalenii



TREE ALOE



A
L
O
E
S





ADENIUM SP. DESERT ROSE





AGAVE PLANT INFORMATION



FROM SMALL TO LARGE PLANTS



BLOOM ONLY ONCE AND DIE







**LIVE FROM 5 TO 20 YEARS IN
LANDSCAPES**



MAY LIVE UP TO 50 YEARS IN THE WILD

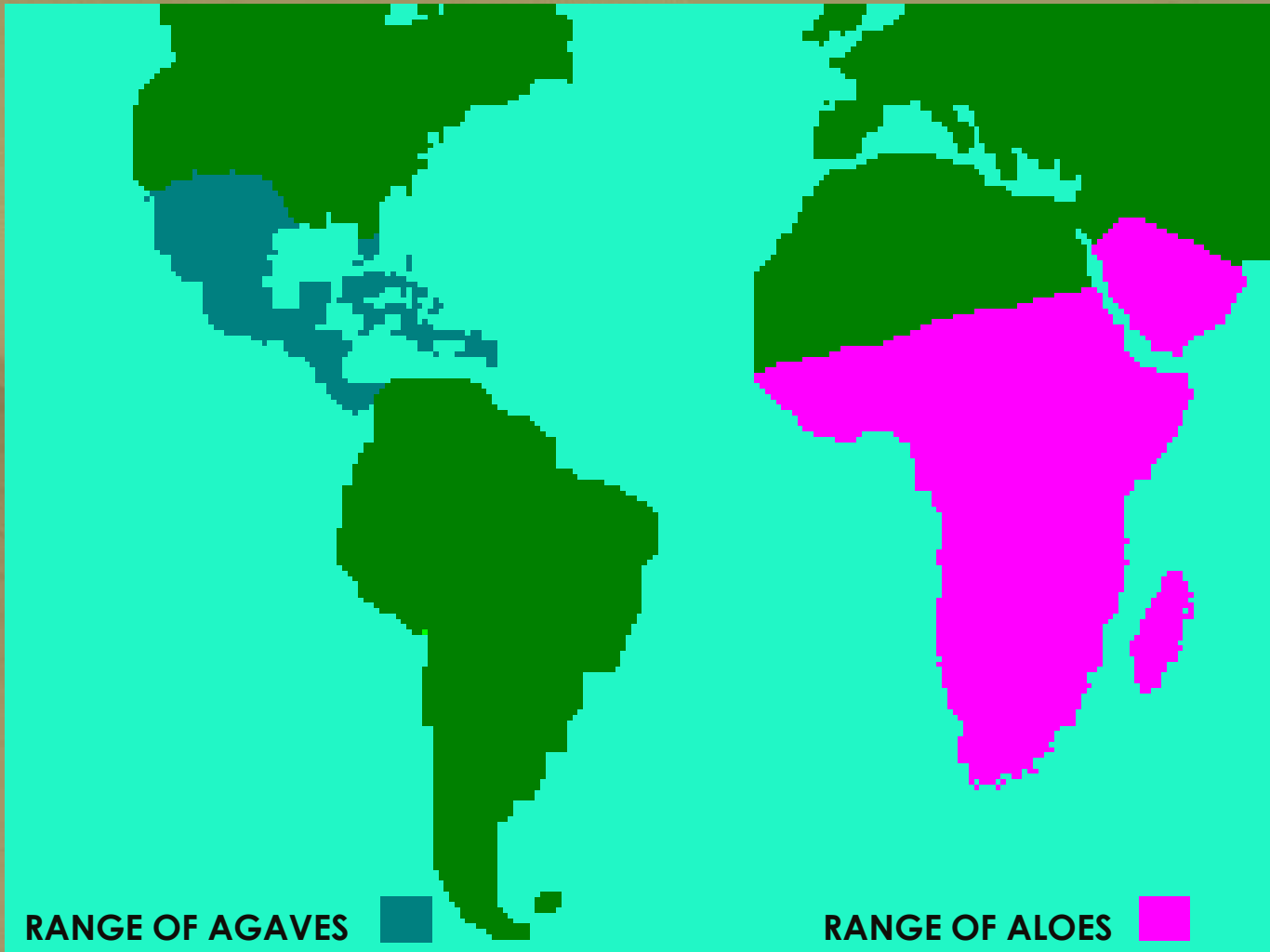
AGAVE PRODUCTS

-  **THE CORE OF THE TENDER INNER LEAVES IS COOKED AND EATEN.**
-  **THE ROOTS ARE USED TO MAKE SOAP** (PLANT ROOTS CONTAIN SAPONINS; FOAMING AGENT)
-  **SISAL FOR ROPE AND TWINE MAKING COMES FROM THE CRUSHED LEAVES OF THE AGAVE SISALANA (A LOW STRETCH, HARDWEARING, HEAT RESISTANT MATERIAL)**
-  **TEQUILA IS MADE FROM THE FERMENTED HEARTS OF THE AGAVE**



ECOLOGICAL CONVERGENCE

UNRELATED ORGANISMS EVOLVED WITH SIMILAR TRAITS IN SIMILAR ENVIRONMENTS





AGAVES

LIVING GARDEN SCULPTURES



Agave Americana
✓ medl





AGAVES



THE BLUE AGAVE AND TEQUILA



IN 12 YEARS ONE LARGE BLUE AGAVE CAN WEIGH FROM 45 TO 200 LBS



IT CAN PRODUCE UP TO 9 BOTTLES OF TEQUILA



IT IS COOKED FOR 24 HOURS TO SOFTEN IT AND TO CHANGE THE CARBOHYDRATES TO SUGARS



BLUE AGAVES ARE BEING PRODUCED BY TISSUE CULTURE SO THAT THEY ARE PURE, PRODUCING MORE SUGAR



THE LARGER THE AGAVE LEAVES, THE MORE SUGAR THAT IS PRODUCED





**AGAVE WATER IS PRODUCED
BY CUTTING THE CENTER OUT
OF A MATURE AGAVE.**

**THE WATER IS THEN COLLECTED
TO BE USED AS DRINKING
WATER**

**OR FERMENTED FOR ABOUT A
WEEK.**

**IT IS ALSO USED AS AN ANTI-
INFLAMMATORY AND DIURETIC.**





PRODUCTS MADE FROM AGAVE



www.envirotextile.com



www.etsy.com



onelookout.com



www.etsy.com



[agave fiber httpobrag.orgp=75694](http://agavefiberhttpobrag.orgp=75694)



**DON'T BUY AGAVES THAT ARE
BLOOMING UNLESS THEY ARE
PUTTING ON BABIES AS THEY
ARE GOING TO DIE SOON**





DYCKIAS, HECHTIAS AND PUYAS DESERT BROMELIADS





PUYAS

DESERT BROMELIADS



Puya mirabilis

PUYA DYCKIOIDES



PUYAS





HECHTIA ARGENTEA

HECHTIAS

DESERT BROMELIADS

HECHTIA SP.



HECHITIA TILLANDSIODES





DYCKIAS



DYCKIA NAKED LADY



DESERT BROMELIADS

DYCKIA FOSTERIANA
BRONZE FORM



N



DYKEAS



DYCKIA CV PICANTE
PHOTO FROM SUNSHINE CACTUS



DYCKIA DOWSONII
PHOTO FROM SUNSHINE CACTUS



DYCKIA BEATEA
PHOTO FROM SUNSHINE CACTUS



DYCKIAS





BULBINE S



...eping Fig
...ubing Fig

Bulbine natalensis
Broad Leaved Bulbine





BULBINES





MANFREDAS

TEXAS TUBER ROSES





EPHEDRA NEVADENSIS

MORMON TEA



EPHEDRA SINICA LARGE CHINESE EPHEDRA





FOQUIERIA ocotillo



Fouquieria splendens



Fouquieria macdougalii, Tree Ocotillo





FOUQUIERIA ocotillo

DRY LEAFLET ON THE END OF THE SPINE

LEAFLETS YELLOWING AND
BEGINNING TO DRY BEFORE
DROPPING OFF





FOUQUIERIA ocotillo

**NEW GREEN
LEAVES
YELLOWING
LEAVES
AND SPINES**





HESPERALOE PARVIFLORA RED OR YELLOW YUCCA







YUCCA COLUMNARIS BOOJUM TREE



YUCCAS

YUCCA SCHIDIGERA

MOJAVE YUCCA





**YUCCA BREVIFOLIA VAR.
JAEGERIANA DWARF
JOSHUA TREE**



YUCCAS

JOSHUA TREE

YUCCA BREVIFOLIA





YUCCAS



YUCCA RIGIDA
SILVER YUCCA



YUCCA ROSTRATA
BEAKED YUCCA





YUCCAS



YUCCA ELATA **SOAP YUCCA**



YUCCAS

YUCCA FAXONIANA

PALM YUCCA (VERY LARGE UP TO 20 FEET)



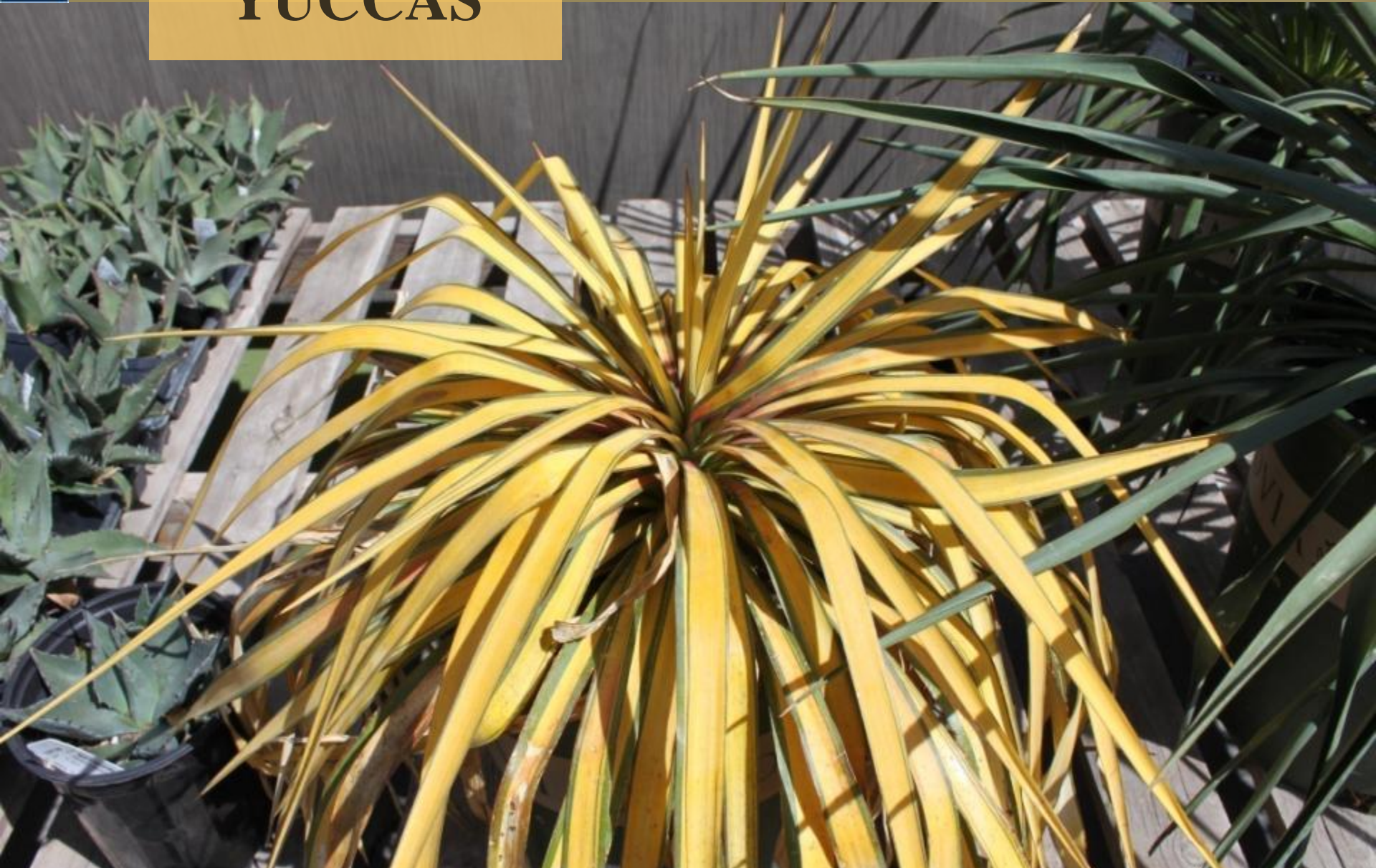


YUCCAS

**YUCCA FILAMENTOSA COLORGARD
ADAM'S NEEDLE**



YUCCAS



YUCCA FILAMENTOSA
BANANA SPLIT



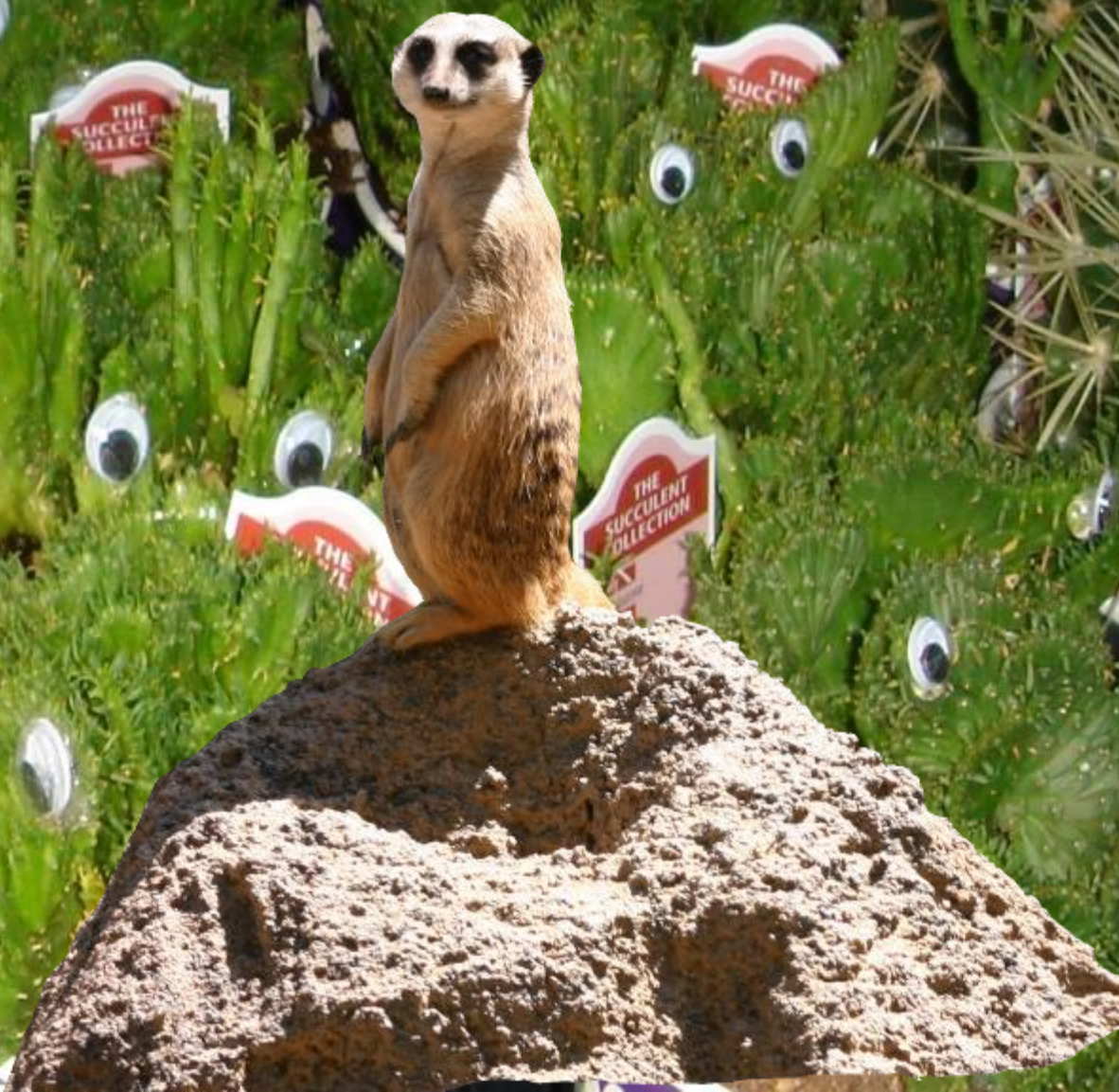
PSEUDOLITHOS CUBIFORMIS

SOME PLANTS ARE SQUARE





LETS LOOK AT SOME CACTI





CACTI AND SUCCULENTS CAN BE USED IN MANY WAYS





CACTI AND SUCCULENTS CAN BE USED IN MANY WAYS





**ANYONE CAN
GROW THESE**

**THIS IS CALLED
A PRACTICE
CACTUS**



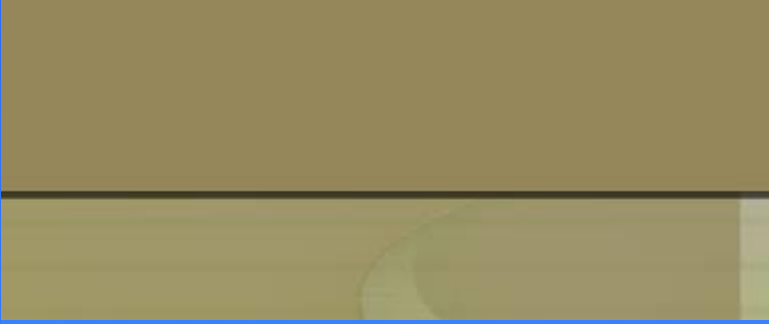
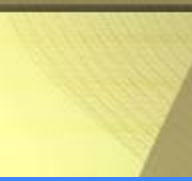


ANYONE CAN GROW THESE











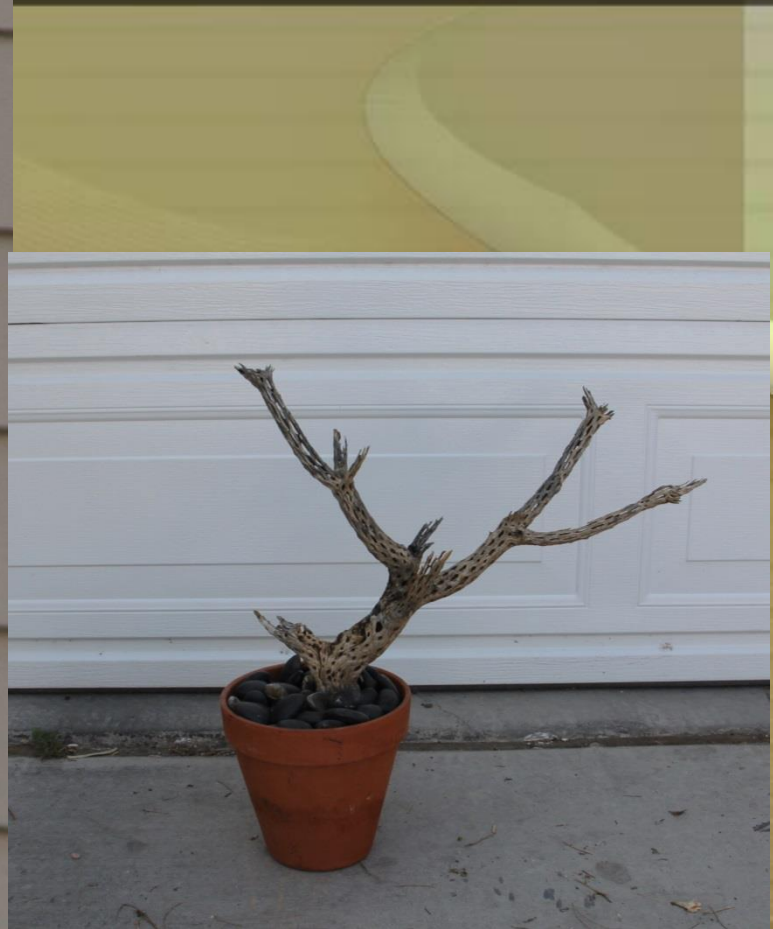








CACTUS ART



The background of the slide is a detailed, close-up photograph of a cactus cross-section. It shows a complex network of green vascular bundles (xylem and phloem) arranged in a radial pattern, with prominent red vascular bundles visible. The overall appearance is that of a highly textured, fibrous plant structure.

**FOR MORE INFORMATION
ON CACTI AND OTHER
DESERT PLANTS**



Cacti and Succulents in Southern Nevada

This curriculum addresses the subject of growing cacti and succulent plants in southern Nevada and the south west. It is divided into 14 sections that can be taught individually or in groups as determined by the instructor. The goal of the curriculum is to have the students better understand how cacti and other desert plants have evolved to survive and how to select, plant, maintain and propagate in the harsh urban landscape and to answer most questions that the students would have about cacti and succulent plants.

Check made payable to:

Board of Regents

SEND ORDER TO:

University of Nevada
Cooperative Extension
Attn: M.L. Robinson
8050 Paradise Road,
Suite 100
Las Vegas, NV 89123
Phone: 702-257-5529
Fax: 702-222-3100
Email:
robinsonm@unce.unr.edu



Order Rates:

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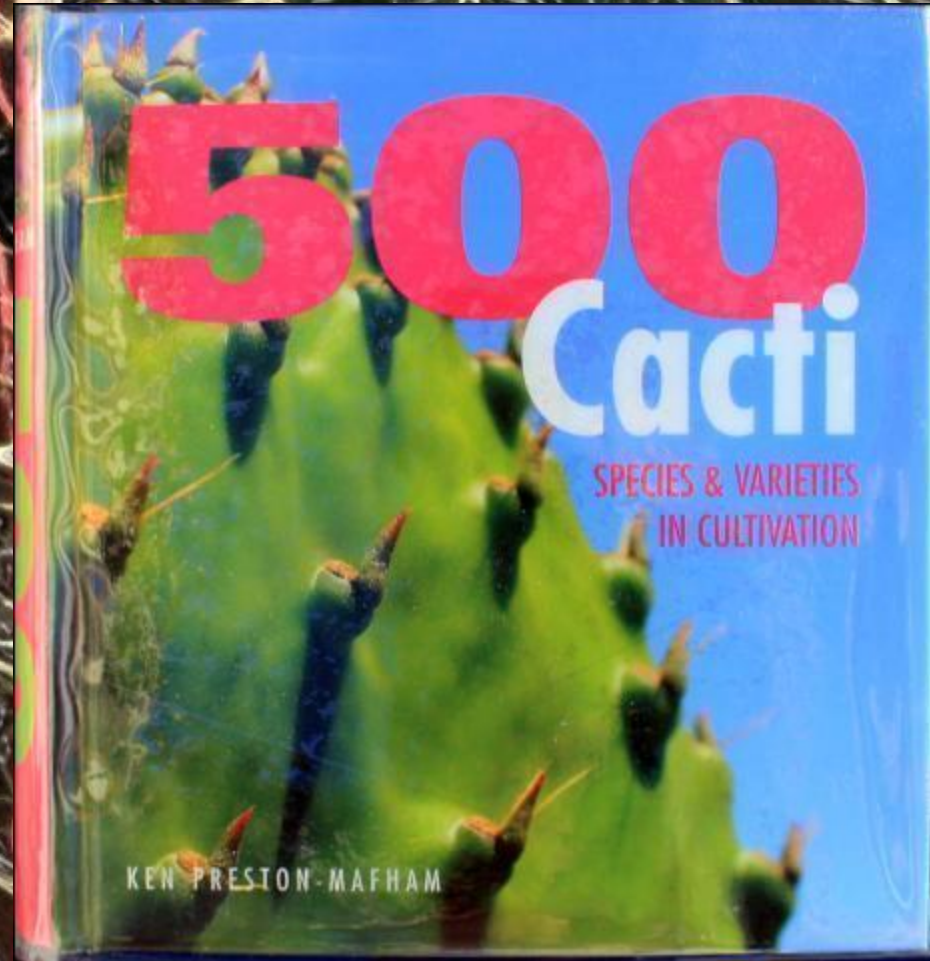
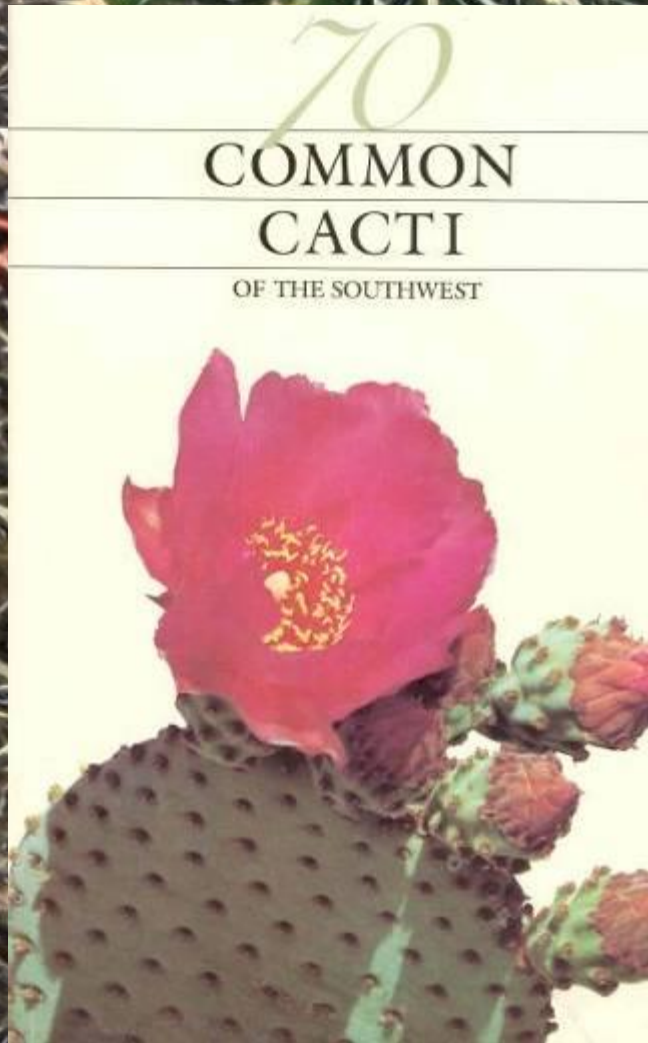
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BOOKS



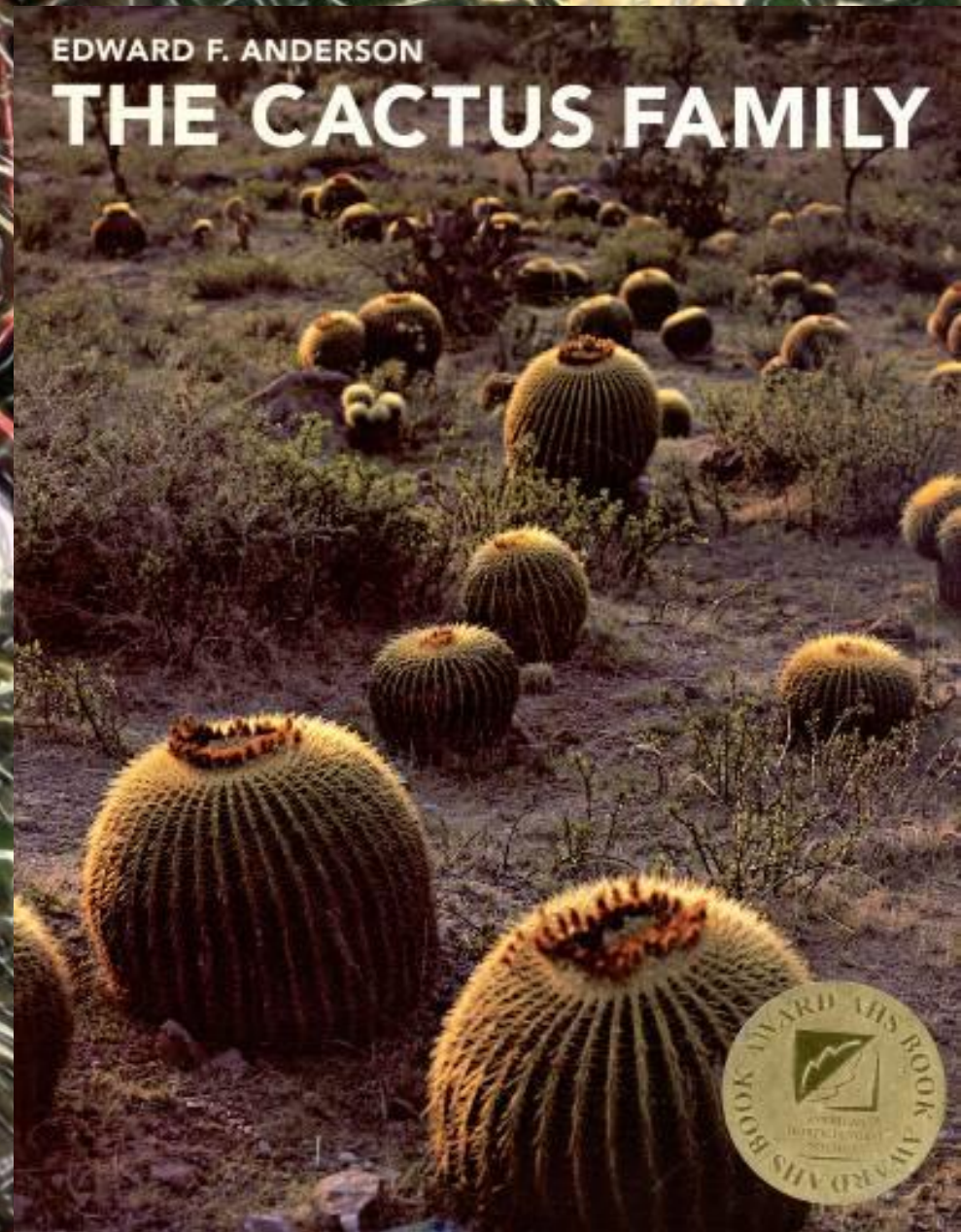
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EDWARD F. ANDERSON

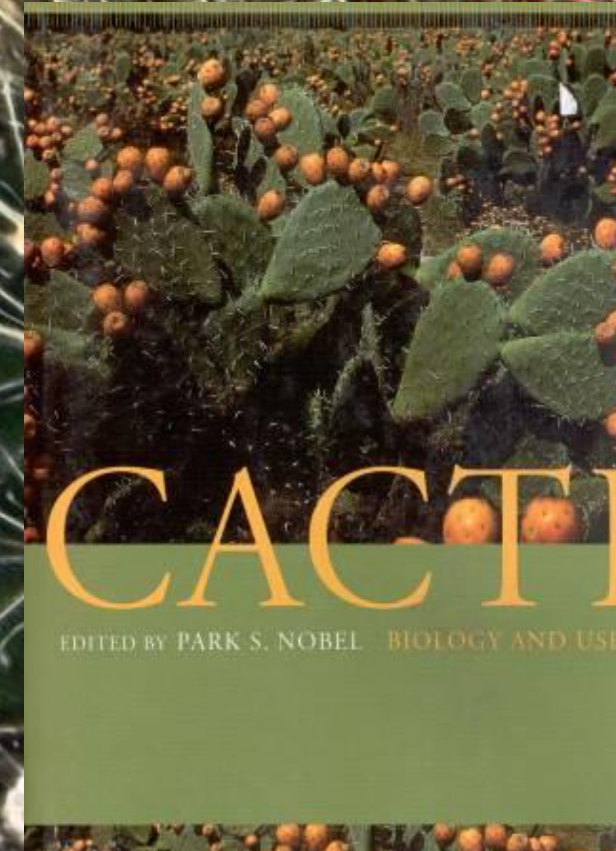
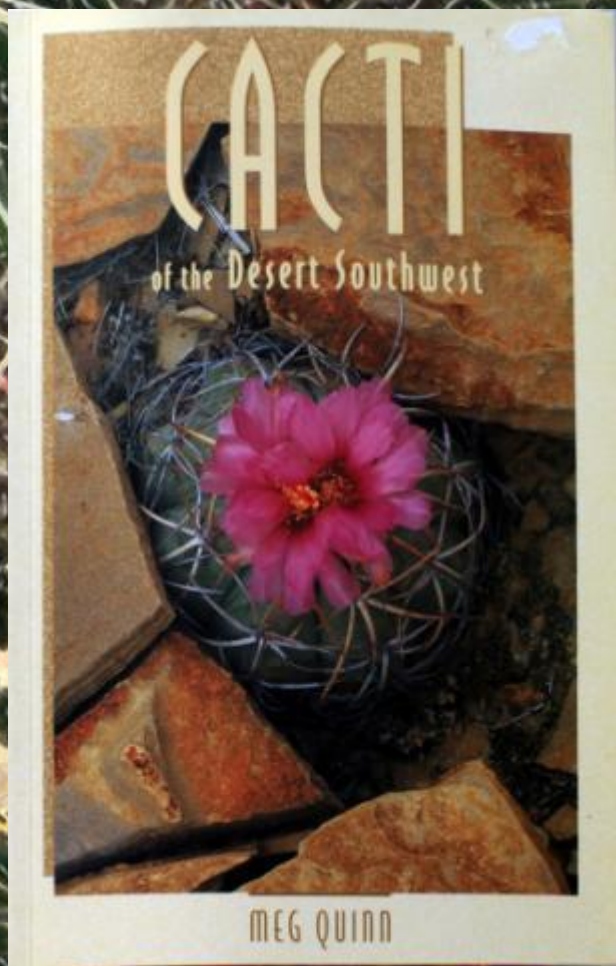
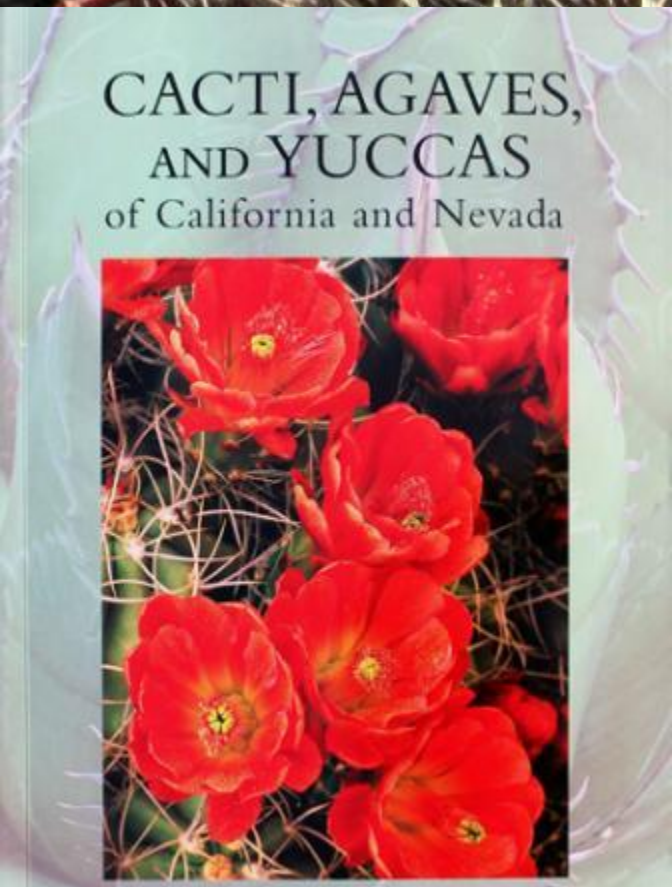
THE CACTUS FAMILY



THE ALL ABOUT
SAGUAROS
TEXT BY CARLE ROOSE
THIRD EDITION
ARIZONA
HIGHWAY



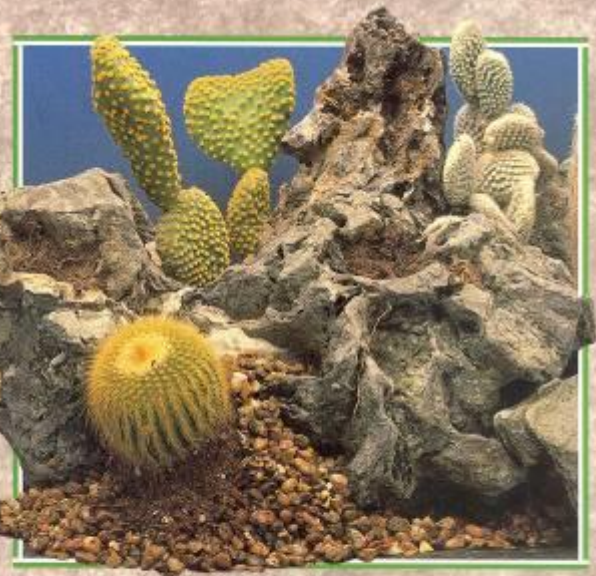
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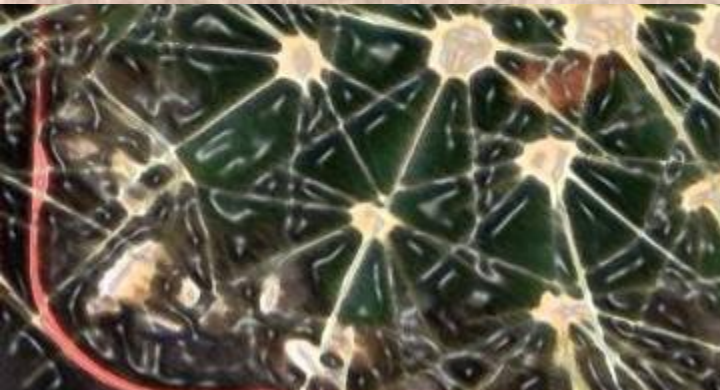
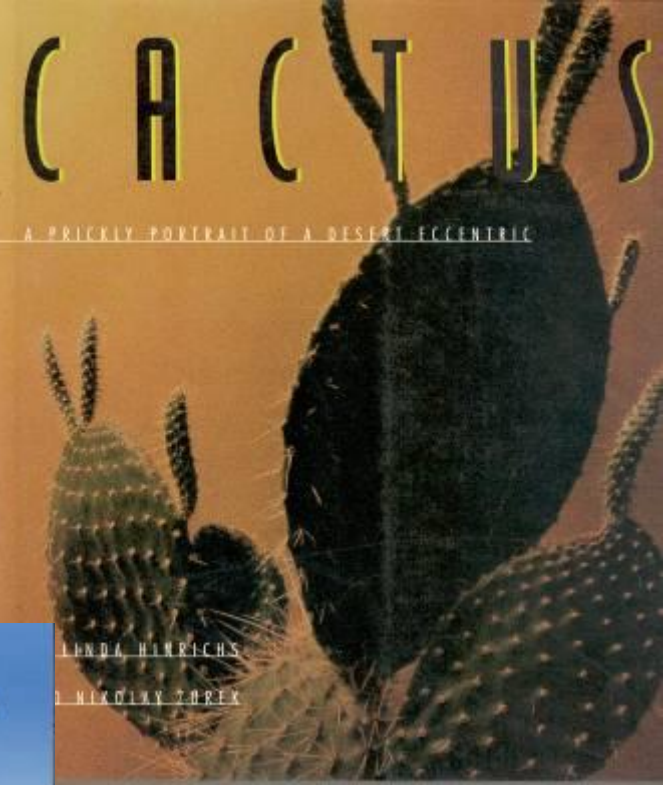
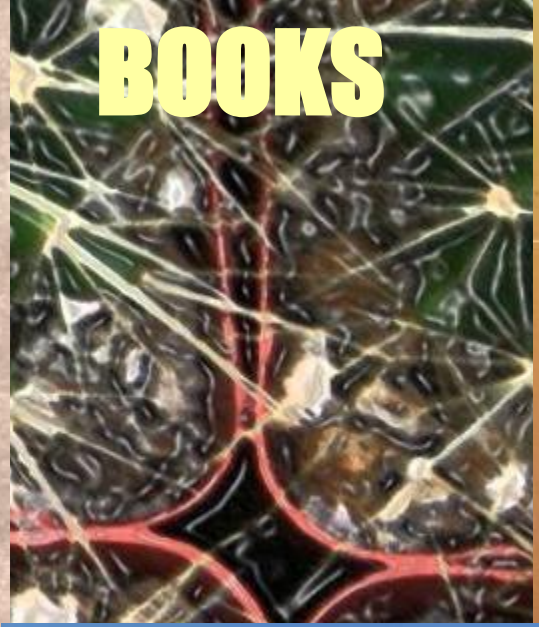
CACTI AND SUCCULENTS

■ Step-by-Step to Growing Success ■

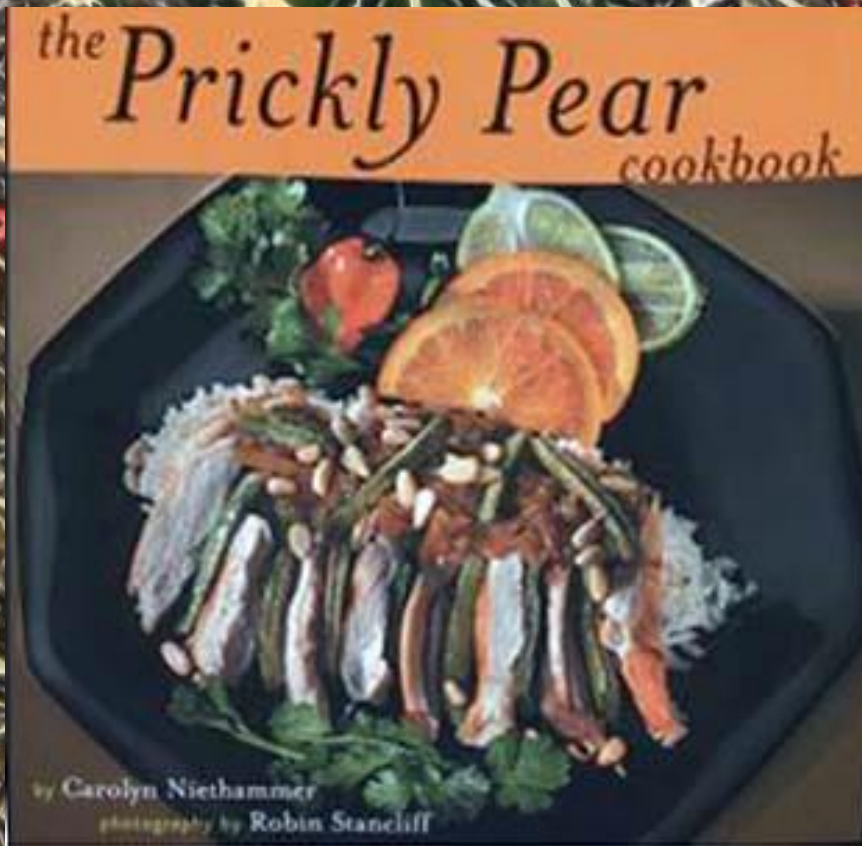


■ Bill Keen ■

BOOKS



BOOKS



Prickly Pear Cactus Medicine



Treatments for Diabetes,
Cholesterol,
and the Immune System
Ran Knishinsky

Y
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in the Southwest and Midwest
of the USA and Canada

BOOKS

Agaves
OF CONTINENTAL
NORTH AMERICA

Howard
Scott
Gentry



AGAVES
YUCCAS
and Related Plants
A GARDENER'S GUIDE



MARY & GARY IRISH



BOOKS



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A Guide to Growing
**PACHYCAUL AND
CAUDICIFORM PLANTS**

Philippe de Vosjoli



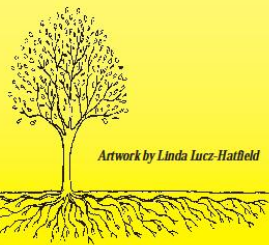
Care of Desert-Adapted Plants

DELLA C. FLETCHER

PATRICIA H. WATERFALL

AZ1048
COOPERATIVE EXTENSION
COLLEGE OF AGRICULTURE

THE UNIVERSITY OF
ARIZONA
TULSON, ARIZONA



Artwork by Linda Lucz-Hatfield

Printed on Recycled Paper



HOW TO TRANSPLANT A CACTUS

Moving a cactus need not be a daunting task. By following these easy-to-follow steps you can successfully move a cactus in the landscape. Attempt to transplant the cactus to an area that is similar to the original site in regard to light exposure, freeze potential, excessive heat, soil type

and texture, irrigation method and schedule, orientation, and other abiotic factors. Cacti should not be moved during the winter or when nighttime temperatures are below 60°F (16°C) because rooting will be delayed or inhibited by the cold soil temperatures and the plant may die.

Step 1: Select a healthy cactus. Choose a plump specimen that is free of blemishes, obvious disease, bruises and abrasions (Fig. 1). If the plant has been lying on the ground, check for sunburning (yellowing) on the exposed side or insect and rodent damage.




Figure 1.

Step 5: If the plant is large or heavy, the next step may require two people. Take a garden hose and wrap it around the plant. Place the hose slightly below the midpoint of the side of the plant. Use the hose to lift the plant out of the ground (Fig. 4).




Figure 4.

Step 2: Mark one side of the plant so that you can orient the plant in the direction as it was in its original location (Fig. 2). This will prevent or minimize sunburn damage to the plant.



Figure 2.

Step 6: Place the plant on its side. Trim off any damaged parts of the roots, the plant will grow new roots when replanted (Fig. 5). Damaged roots will typically decompose and are an entry point for root rotting pathogens. Do not remove any healthy undamaged roots.




Figure 5.

Step 3: Carefully dig out the roots about 6 inches around plant. Try to get as many roots as possible. The roots of cacti are fragile, fleshy and close to the soil surface (Fig. 3).




Figure 3.

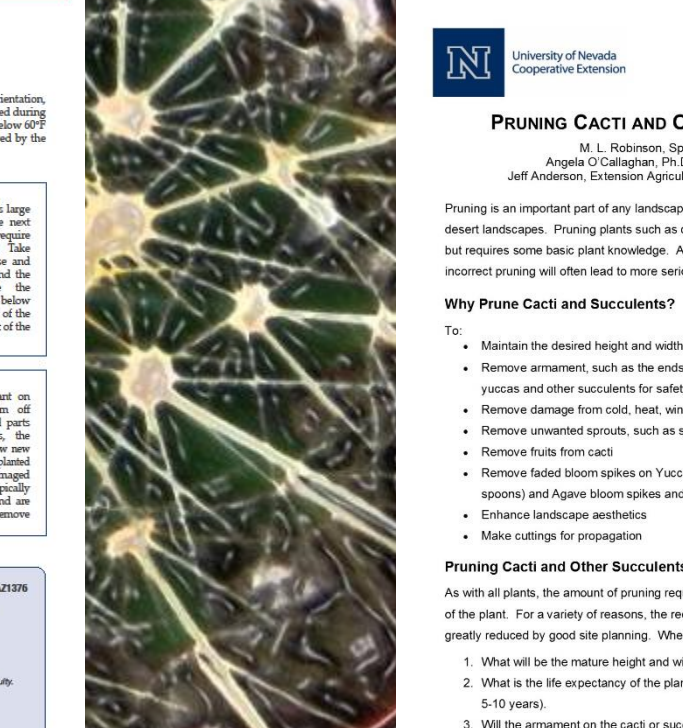
9/2005 THE UNIVERSITY OF ARIZONA COLLEGE OF AGRICULTURE AND LIFE SCIENCES TULSON, ARIZONA 85721 AZ1376

JACK KELLY Assistant Agent, Agriculture, Pima County

This information has been reviewed by university faculty.

caas.arizona.edu/pubsgarden/az1376.pdf

Step 4: Once the plant is loose, carefully work a shovel under the plant and lift it out using a gentle prying motion.



HOW TO PROPAGATE AGAVES AND CACTI FROM CUTTINGS AND SEED

Jack Kelly

Introduction

Propagation of most cacti and agaves is a very simple procedure. Many varieties can be successfully propagated by both vegetative cuttings and from seed. This guide provides basic information that will help to insure successful results.

Vegetative propagation

Vegetative propagation relies on the plant's ability to produce new roots and shoots from an existing part of the plant such as a stem or leaf. Some of the easiest cactus to propagate in this way include *Cereus*, *Cylindropuntia* (Cholla), *Echinopsis*, *Lophocereus*, *Mammillaria*, *Opuntia* (Prickly pear), *Stenocereus*, and *Trichocereus* hybrids.

The time of year has a great influence on the success or failure of plant propagation. The first step in the process is to determine which species root best in warm weather and which root best in still warmer weather. Taking cuttings during appropriate months of the year when temperatures at night are conducive to rooting and root development is the key to success. As a rule, cuttings taken when nighttime temperatures are 60°F (16°C) and above will root successfully. When cuttings are taken during inappropriate months of the year, rooting may be delayed or not occur at all.

When working with prickly pear (*Opuntia*) cuttings, agaves and other spiny plants, care must be taken to avoid being injured while handling the plants. Always wear gloves or use tongs; avoid contact with the plants.

Always take cuttings from healthy plants that are representative of that species. Do not propagate cuttings that are badly blemished, bruised, diseased, shriveled, rotted or otherwise not clean and healthy. The size of the cutting will depend on the species and the size of the parent



Fig 1. Removing plantlets (right) from parent plant (left)

small immature globes or plantlets from the stock plant (Fig.1). The location of the cutting removal is not critical with columnar cactus, although cuttings from this or last year's growth generally root best.

The use of plant rooting compounds is not critical for successful rooting of many species of cacti although many commercial propagators will use them as 'insurance' to enhance rooting percentages. Sulfur is often used to help ward off invasion of the cutting by pathogens. It is essential that all cuttings be air dried until the soft inner tissue calluses over.



Fig 2. Mature plant with numerous pupae or offsets

Agaves are easily propagated by removing the offsets or 'pups' from the parent plant (Fig. 2). Always leave a small portion of the stem that connected the offset to its parent on the base of the offset. It is in this area where new roots will develop. If cut too close to the base of the offset, the roots will not form. All broken or damaged roots should be removed leaving about



PEER REVIEWED SP-15-XX

PRUNING CACTI AND OTHER DESERT SUCCULENTS

M. L. Robinson, Specialist/Associate Professor
Angela O'Callaghan, Ph.D., Specialist, Associate Professor
Jeff Anderson, Extension Agricultural Agent, New Mexico State University

Pruning is an important part of any landscape maintenance program, including southwestern desert landscapes. Pruning plants such as cacti, Yuccas, Agaves and other succulents is simple, but requires some basic plant knowledge. As with other plants in the landscape, poor and incorrect pruning will often lead to more serious problems, including premature death of the plants.

Why Prune Cacti and Succulents?

- To:
 - Maintain the desired height and width of the original plant
 - Remove armament, such as the ends of leaves (spines) on agaves, yuccas and other succulents for safety purposes
 - Remove damage from cold, heat, wind, accidents and vandalism
 - Remove unwanted sprouts, such as suckers on agaves and/or yuccas
 - Remove fruits from cacti
 - Remove faded bloom spikes on Yuccas, Nolinias, sotols (desert spoons) and Agave bloom spikes and plant (when they die)
 - Enhance landscape aesthetics
 - Make cuttings for propagation

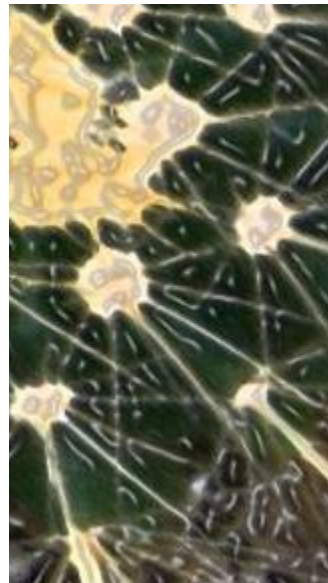


(Cocotillo)

Pruning Cacti and Other Succulents

As with all plants, the amount of pruning required is often dictated by the placement and function of the plant. For a variety of reasons, the requirement to prune cacti and succulents may be greatly reduced by good site planning. When selecting a plant, consider the following:

1. What will be the mature height and width of the plant?
2. What is the life expectancy of the plant? (Most agaves bloom and die after flowering in 5-10 years).
3. Will the armament on the cacti or succulent be a danger to people and pets?





CACTUS, AGAVE, YUCCA AND OCOTILLO

Jack Kelly, Rob Grumbles

Cactus

Cactus can give that authentic touch of native dignity that seems to legitimize and complement Arizona desert landscapes. They make excellent specimen plants or striking accents. The Cactus family numbers over 2000 species. Typically cactus are devoid of leaves and have swollen stems, spines or scales. All cacti are native to the New World and are found from North America to the southern tip of South America.

The thick waxy coated stems of these perennial herb are quite resistant to moisture evaporation, which gives them considerable drought tolerance. Desert cacti are leafless; however, most have spines. Photosynthesis (food production for the plant) occurs within the green outer cortex of the stems, and moisture reserves are stored in the internal part of the stems, sustaining these plants through prolonged dry periods of desert climates. Structural support for cactus plants is provided by internal fibrous or woody skeletal forms. Most cacti have tapering tap roots that anchor the plant and fleshy lateral roots close to the soil surface that extend outward for several feet in all directions. These absorb and store moisture and nutrients. The rose-like flowers of cacti, which are contrastingly delicate and beautifully colored, produce edible although sometimes not too palatable fruit.



Opuntia violacea 'Santa Rita', an Arizona native 'prickly pear' cactus

Transplanting is usually necessary since cacti seldom occur naturally in desired landscape locations. Although they can be transplanted year-round in southern Arizona's lower elevations, quicker reestablishment can be expected from March through October. Warmer temperatures favor active root growth and, consequently, quicker establishment of the transplanted cactus.

This is very important to remember. The more time you spend before transplanting, and the more time you spend in protective shade cloth establishment, the better. To remove shallow roots from the soil, be sure to take the plant or plant when taken up and above and below the soil line.



Golden barrel cactus (Echinocactus grusonii)



Problems and Pests of Agave, Aloe, Cactus and Yucca



AZ 1399 July 2006

HARVESTING & PROCESSING PRICKLY PEAR FRUIT AND MAKING PRICKLY PEAR LEMONADE PUNCH

When the desert is full of that gorgeous magenta fruit laden prickly pear (usually in July/August), don't let the opportunity pass to enjoy the gift of the vitamin rich juice contained in those fruits. It can be obtained easily through either of the following methods and frozen in plastic bags or containers for use throughout the year.

Gather prickly pear fruit from your own property or with the permission of the property owner. Remember, it is illegal to gather plants, fruit, seeds or an plant parts from State or Federal lands or roadways without written permission. Always leave some of the fruit for the animals, they need food too.

METHOD I: (from Patsy Frannea)

Using tongs, carefully remove fruit from the plant when it is at its deep, magenta-colored ripeness peak and place in a large pail. You can usually tell when it starts to fall off the plant or you see signs that the birds are starting to feast on it. I usually try to leave some fruits on the plant around the edges for the animals to easily reach for their share. Note, use caution when picking and handling the fruit... especially on a windy day. The small short reddish stickers (glochids) can easily become airborne and land on you and stick in your skin or worse - get in your eyes.

Rinse the desert dirt off of the fruits and then use tongs to load a batch into your blender. Process quickly until liquefied and pour the liquid mixture into a fine mesh strainer or a colander lined with cheesecloth that has been placed over a large bowl. This will strain out all of the seeds and stickers and you will have a prickly pear juice that can be used or frozen for drinks, sauces, syrups, jellies, etc. Toss the pulp in your compost pile.



METHOD II: (from Faye Libbey)

Pick the fruit off of the plant as described in Method I. Rinse and use tongs to load into plastic bags. Freeze the bags of fruit for at least a couple of days. Remove from freezer and dump fruit into a strainer or colander as described above. The freezing will have softened the fruit and when thawed the juice will easily flow to be strained for your use.

RECIPE for PRICKLY PEAR LEMONADE (from Patsy Frannea)

To make Prickly Pear Lemonade like we serve at the TCCS meetings and cactus sales events, just mix a can of lemonade, one can of water, one can or less of prickly pear juice and 2 cans (or more to taste) of any

pear recipes will give you lots of idea

www.tucsoncactus.org

How to Plant & Care For Your New:



Saguaro Cactus Barrel Cactus



Hedge Hog Cactus

Your cactus was rescued by volunteer members from the "Cactus Rescue Crew" of the Tucson Cactus and Succulent Society. It was rescued from a Greater Tucson area that was destined to be cleared for new development. Thanks to a cooperative developer, the Cactus Rescue Crew, and you, this Native Plant will have a new home and not end up being destroyed or in a landfill.

How to Plant & Care For Your New:

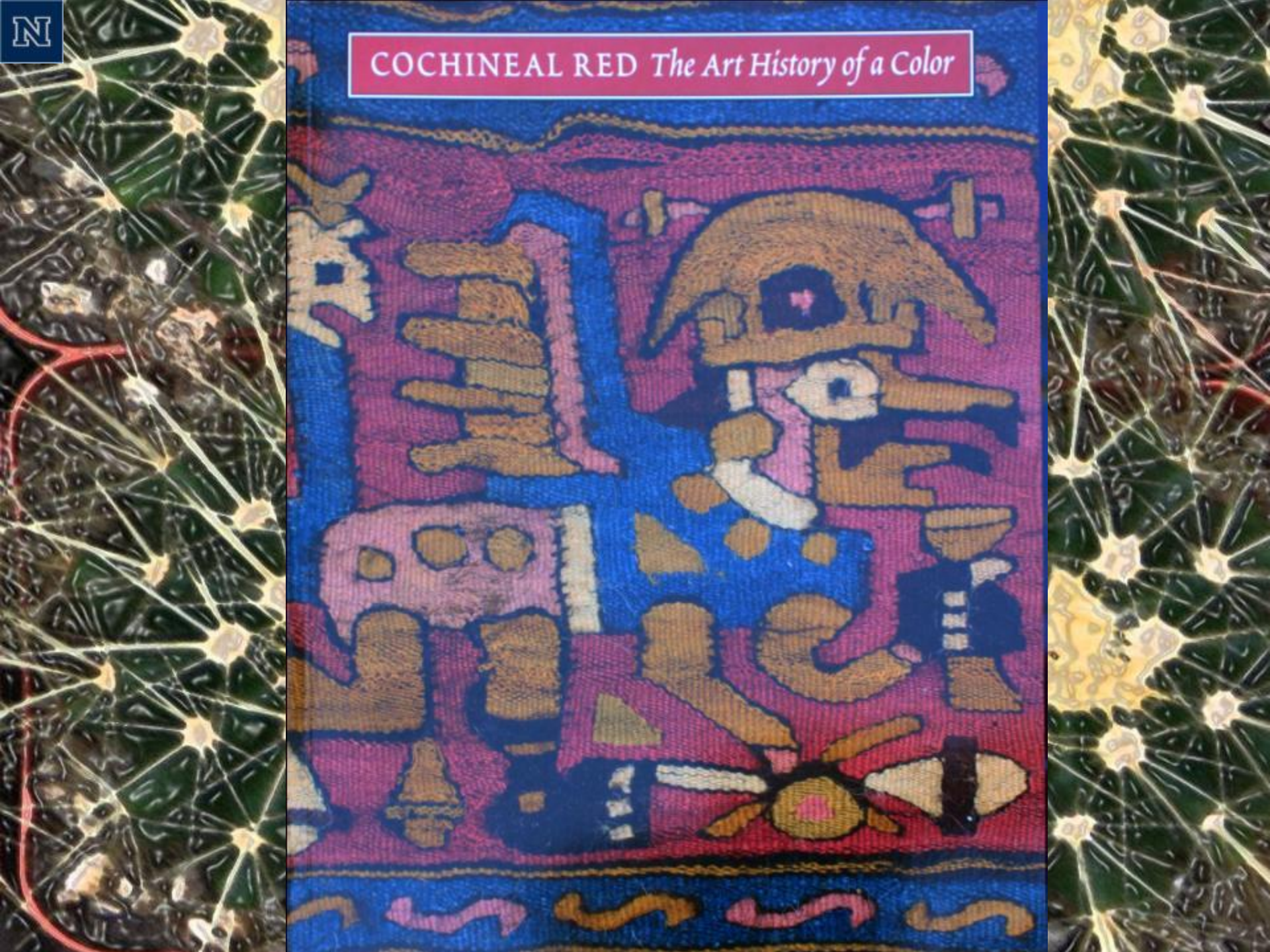


Ocotillo

Your Ocotillo was rescued by volunteer members from the "Cactus Rescue Crew" of the Tucson Cactus and Succulent Society. It was rescued from a Greater Tucson area that was destined to be cleared for new development. Thanks to a cooperative developer, the Cactus Rescue Crew, and you, this Native Plant will have a new home and not end up being destroyed or in a landfill.



COCHINEAL RED *The Art History of a Color*





**DO YOU
HAVE
ANYTHING
WITH
MORE
SPINES ?**



**SAY IT
WITH
FLOWERS**



CACTUS JAN SAYS DON'T DO THIS WITH YOUR CACTUS



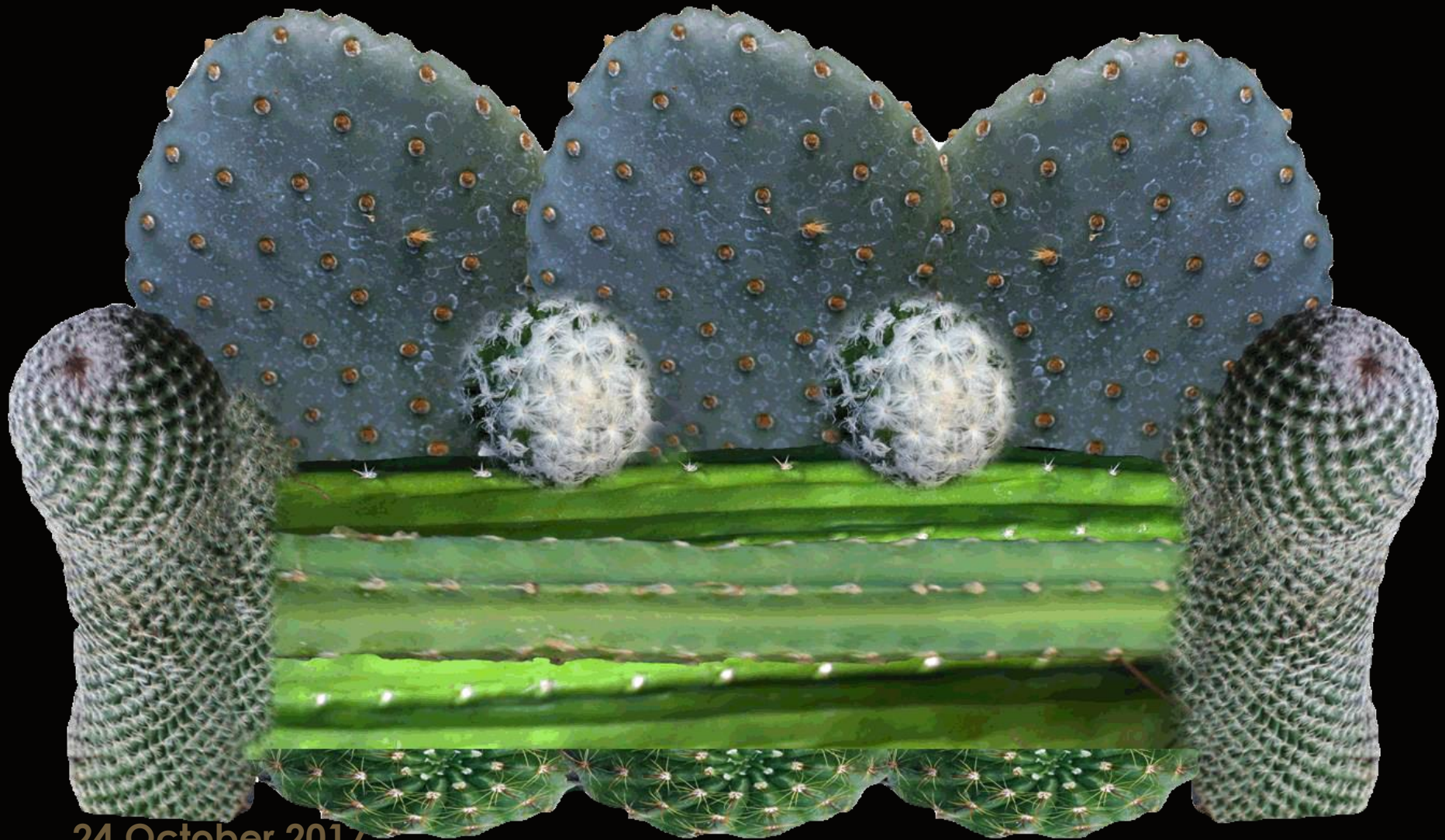


DON'T TRY THIS WITH YOUR CACTUS





THINGS NOT TO DO WITH YOUR CACTUS



24 October 2017

THINGS NOT TO DO WITH YOUR CACTUS



PAOLO DEL PIANO SUCCULENTS

24 October 2017





“OUR WORK, OUR THINKING, OUR LIVES, OUR CULTURE AND SOCIAL ACTIVITIES ARE SHAPED BY THE INFLUENCES OF THE COUNTRY IN WHICH WE RESIDE.”

SOUTHERN NEVADANS ARE DESERT PEOPLE.

(TAKEN FROM FORREST SHREVE WRITINGS SIGNAGE AT DESERT Botanical Garden, 1938)



CACTI FOR THE LANDSCAPE

Photo by Jan
Emming yucca AZ





ASTROPHYTUM MYRIOSTIGMA

BISHOP'S CAP



SAGUARO; SYMBOL OF THE SONORAN DESERT





CARNEGIEA GIGANTEA

SAGUARO



**THE TALLEST SAGUARO
WAS 52 1/2 FEET TALL**

(NEAR TUCSON, AZ; IT BLEW OVER IN 1975)



**SAGUAROS CAN LIVE
OVER 200 YEARS**

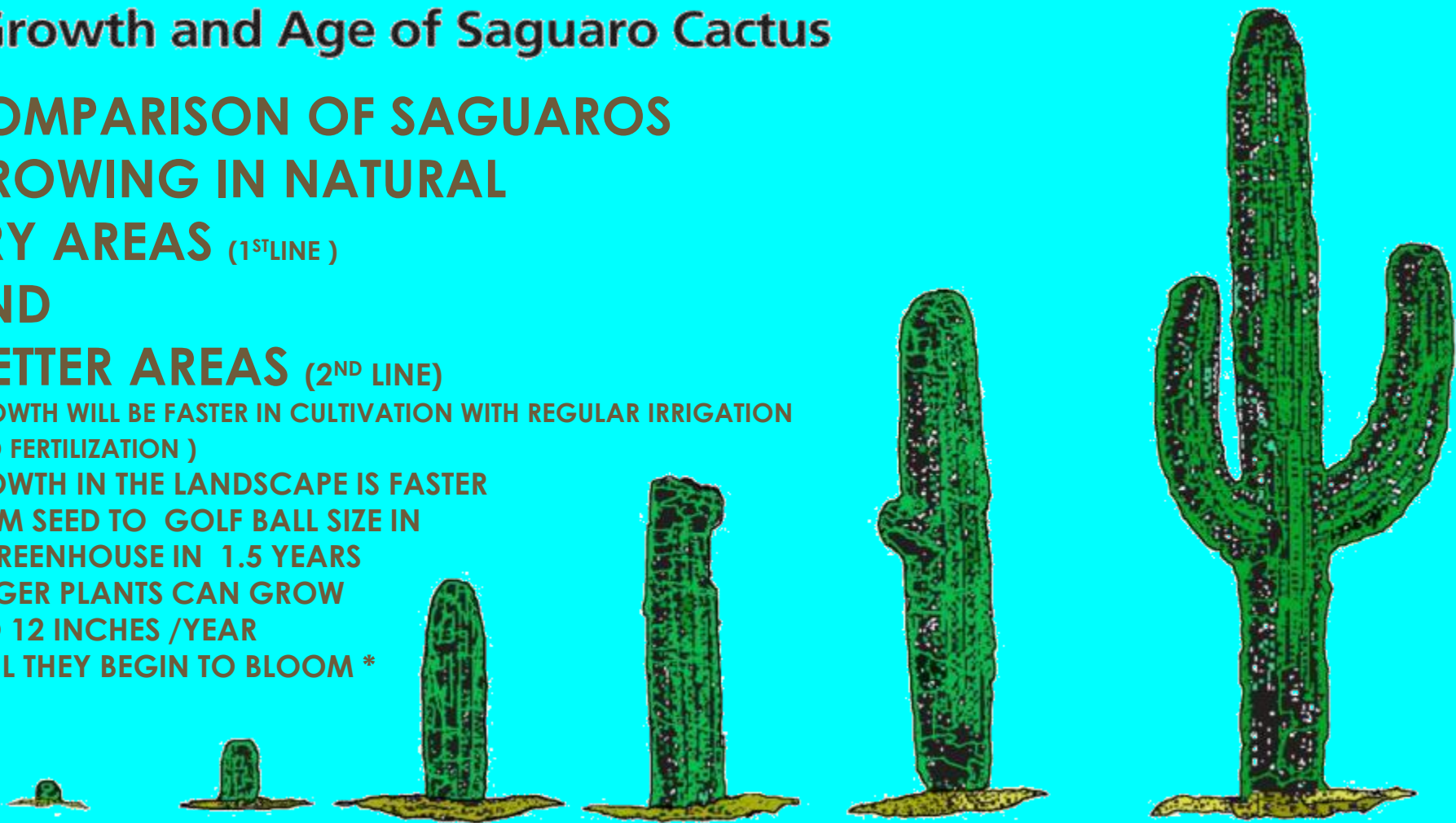


Growth and Age of Saguaro Cactus

COMPARISON OF SAGUAROS GROWING IN NATURAL DRY AREAS (1ST LINE) AND WETTER AREAS (2ND LINE)

(GROWTH WILL BE FASTER IN CULTIVATION WITH REGULAR IRRIGATION AND FERTILIZATION)









GROWTH IN THE LANDSCAPE IS FASTER FROM SEED TO GOLF BALL SIZE IN A GREENHOUSE IN 1.5 YEARS LARGER PLANTS CAN GROW 6 TO 12 INCHES /YEAR UNTIL THEY BEGIN TO BLOOM *



| | | | | | |
|--------------|-------------|-------------|------------------------------|--|-------------------------|
| 1 INCH TALL | 1 FOOT TALL | 3 FOOT TALL | 6 FEET TALL FIRST FLOWERS | 15 TO 18 FEET TALL 1 ST ARMS | FULL HEIGHT |
| 10 YEARS | 31 YEARS | 50 YEARS | 69 YEARS | 85- 100 YEARS | 200 YEARS 200 FEET TALL |
| 6 TO 7 YEARS | 17 YEARS | 26 YEARS | 36 YEARS | 55 – 60 YEARS | 173 YEARS 46 FEET TALL |

INFORMATION TAKEN FROM NATIONAL PARK SERVICE ORGAN PIPE NATIONAL MONUMENT PUBLICATION , GRAPHICS OF CACTUS COLORIZED FROM THE PUBLICATION AND* RUSS BURROW ,TOHONO CHUL PARK TUCSON AZ

SAGUARO FACTS

-  AVERAGE HEIGHT 10 TO 30 FT. BUT CAN GROW TO 78 FT.
-  THE AVERAGE NUMBER OF ARMS IS 5
-  CAN LIVE FROM 100 TO 200 YEARS
-  HAS A FLEXIBLE WOODEN SKELETON TO SUPPORT ITS HEIGHT (REINFORCEMENT BARS)
-  MOST GROWTH IS FROM JUNE TO SEPTEMBER
-  75% TO 95% OF THE CACTUS IS WATER
-  CAN WEIGH UP TO 6 TONS OR 12,000 POUNDS
-  CAN HOLD UP TO 1,500 GALLONS OF WATER

SAGUARO FACTS

- 🌵 ROOTS GROW OUT AS FAR AS THE HEIGHT OF THE CACTUS, UP TO 78 FT
- 🌵 ROOTS GROW DOWN TO 3 FT
- 🌵 NEW ARMS PROVIDE MORE AREA FOR FLOWER AND SEED PRODUCTION
- 🌵 EACH FRUIT CAN PRODUCE 2,000 SEEDS
- 🌵 EACH SAGUARO CAN PRODUCE MILLIONS OF SEEDS EACH YEAR
- 🌵 THE PRIMARY CAUSE OF DEATH IS FROST
- 🌵 FIRE, HIGH WINDS, BACTERIAL ROTS, AND URBANIZATION ALSO CAUSE DEATH



CARNEGIEA GIGANTEA SAGUARO

**SHADE FROM DESERT TREES
PROTECT YOUNG SAGUAROS**





CARNEGIEA GIGANTEA SAGUARO

**FROM 55 TO 100 YEARS OLD
SAGUAROS BEGIN DEVELOPING AND
GROWING ARMS
10 TO 15 FEET TALL**





CARNEGIEA GIGANTEA

SAGUARO

**OLD SAGUAROS GROW TO BE
OVER 50 TO 78 FEET TALL
AND LIVE 100 TO 200 YEARS**





CARNEGIEA GIGANTEA

SAGUAROS ADD BEAUTY TO THE LANDSCAPE EVEN WHEN DEAD

SAGUARO



SAGUARO BOOTS (BIRD CAVITIES)





CEREUS PERUVIANUS

NIGHT BLOOMING CEREUS

32 TO 36 INCHES
PROTECT FROM
FREEZES





CLEISTOCACTUS STRAUSII

SILVER TORCH

GROWS IN CLUMPS
TO 5 FEET





CYLINDROPUNTIA ARBUSCULA

PENCIL CHOLLA





OTHER PENCIL CHOLLA



USES OF PENCIL CHOLLA CACTUS



NATIVE AMERICANS ATE THE SEEDS



USED THE PULP FOR WATER



THE SPINES WERE USED TO MAKE BASKETS

USES OF THE PENCIL CHOLLA CACTUS



NATIVE AMERICANS USED THEM TO MAKE GUM



MIXED WITH OIL TO MAKE CANDLES



ADDED TO PLASTER TO MAKE IT STICKY



THE NEW PADS ARE EATEN RAW AND COOKED AND EATEN LIKE GREENS



THE SEEDS CAN BE ROASTED AND GROUND TO USE AS A THICKENER FOR COOKING



CYLINDROPUNTIA IMBRICATA

CANE CHOLLA





ECHINOCEREUS (*DASYACANTHUS*) PECTINATUS RUBRISPINUS TEXAS RAINBOW CACTUS





ECHINOCCEREUS PECTINATUS RUBRISPINUS RAINBOW CACTUS





ECHINOCEREUS FENDLERII

FENDLER'S HEDGEHOG CACTUS





ECHINOCEREUS KNIPPELIANUS V. KRUEGERI





ECHINOCACTUS GRUSONII

GOLDEN BARREL CACTUS



ECHINOCACTUS GRUSONII

GOLDEN BARREL CACTUS





ECHINOCACTUS GRUSONII

GOLDEN BARREL CACTUS



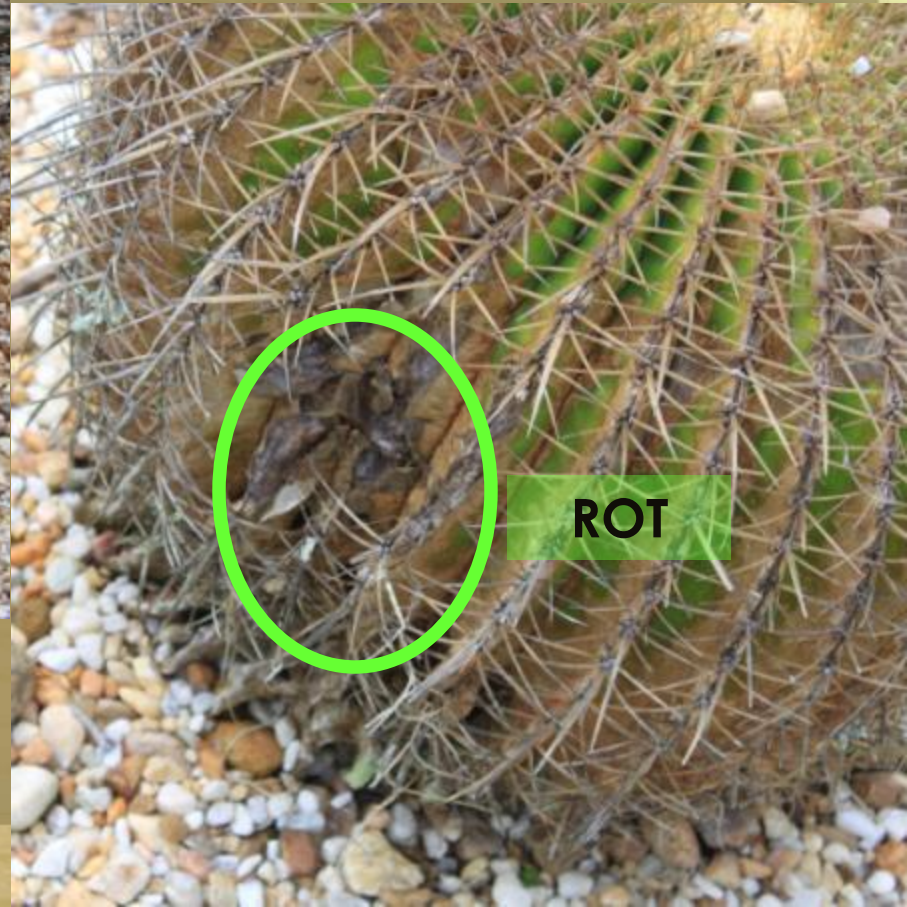


ECHINOCACTUS GRUSONII

GOLDEN BARREL CACTUS



**GOLDEN BARRELS GROWING IN
A HIGH RAINFALL AREA**





ECHINOCACTUS POLYCEPHALUS

COTTON TOP BARREL



**THEY GROW IN ROCKY
AREAS 1,000 TO 5,000 FEET**

**THEY GROW IN CLUMPS OF 10
TO 30 PLANTS**





USES OF COTTON TOP CACTUS



NATIVE AMERICANS ATE THE SEEDS



USED THE PULP FOR WATER



THE SPINES WERE USED TO MAKE BASKETS



ECHIOCEREUS LEDINGII

HEDGEHOG CACTUS



ECHINOCCEREUS TRIGLOCHIDIATUS

CLARET CUP





ECHINOCEREUS TRIGLOCHIDIATUS

CLARET CUP HEDGEHOG
(HIGH COUNTRY GARDENS VERY COLD HARDY)



N ESCOBARIA (CORYPHANTHA) VIVIPARA
MINIATURE SPINY STAR



VERY
COLD
HARDY

ERIOCACTUS WARASSII





FEROCACTUS ACANTHODES

RED BARREL CACTUS BAJA



PHOTO OF AND BY
JAN EMMING AZ.



FEROCACTUS EMORYI





FEROCACTUS CYLINDRACEUS (PENINSULAE) COMPASS BARREL



IT GROWS SLANTED TO THE SOUTH



FEROCACTUS PILOSUS

RED BARREL CACTUS



FEROCACTUS WISLIZENII

FISHHOOK BARREL CACTUS



FEROCACTUS RECTISPINUS

STRAIGHT SPINED BARREL CACTUS



USES OF BARREL CACTUS



NATIVE AMERICANS STEWED THEM



USED THE PULP FOR WATER



**THE SPINES WERE USED TO MAKE
FISHHOOKS**



SEWING NEEDLES



HOMALOCEPHALA TEXENSIS

HORSE CRIPPLER





LOPHOCEREUS SCHOTTII MONSTROSUS

TOTEM-POLE CACTUS





OPUNTIA SP.

OPUNTIAS ARE GROWN IN COLD AREAS LIKE FLAGSTAFF, ARIZONA AND CANADA AS WELL AS IN TROPICAL AREAS LIKE HAWAII, FLORIDA, CHILE AND ARGENTINA



OVER 470 SPECIES OF OPUNTIAS



**OPUNTIAS LIVING ON THE EDGE AT 7,000
FEET**



OPUNTIAS LIVING ON THE EDGE AT 7,000 FEET



OPUNTIA SP.



**THEY RANGE FROM
MINIATURE TO
TREE- LIKE IN SIZE**





OPUNTIA BASILARIS BEAVERTAIL CACTUS



**O. BASILARIS VAR.
BRACHYCLADA
SHORT-JOINT BEAVERTAIL**



OPUNTIA BASILARIS BEAVERTAIL CACTUS IRRIGATED



**BEAVERTAIL CACTUS GROW 2 FT TALL BY
4 FT WIDE**

USES OF THE BEAVERTAIL CACTUS



NATIVE AMERICANS ATE THE VERY SWEET FRUIT



THE NEW PADS ARE COOKED AND EATEN LIKE GREENS



COLORADO SUNSET



MANDARIN SUNRISE

RE-BLOOMERS BLOOMING EVERY 4 TO 5 WEEKS IN THE SUMMER



PEACH PIE



GARNET GLOW



HAWAIIAN PUNCH



CHOCOLATE PRINCESS

RE-BLOOMERS BLOOMING EVERY 4 TO 5 WEEKS IN THE SUMMER



RUFFLED PAPAYA



OPUNTIA BIGELOVII

TEDDY BEAR CACTUS





OPUNTIA BIGELOVII

TEDDY BEAR CACTUS





OPUNTIA ENGELMANNII

ENGELMANN'S PRICKLY-PEAR



Engelmann's Prickly-pear
Opuntia engelmannii
Cactus Family (Cactaceae)
Native to the southwestern United States





OPUNTIA ERINACEA

OLD MAN PRICKLY PEAR

WELL ARMED





OPUNTIA FICUS INDICA

INDIAN FIG

**EDIBLE PADS (NOPALITOS)
AND FRUITS**



**FICUS BECAUSE THE FRUITS
WERE THOUGHT TO BE
MUCH LIKE FIGS**



OPUNTIA FULGIDA

JUMPING CHOLLA

**NOT GOOD FOR
THE GARDEN**





OPUNTIA FULGIDA

CHAIN CHOLLA

**32 TO 36 INCHES
PROTECT FROM
FREEZES**





OPUNTIA LINDEIMERI

COW'S TONGUE CACTUS





OPUNTIA MACROCENTRA

BLACK SPINE PRICKLY PEAR





OPUNTIA MICRODASYS VAR. ALBISPIN

WHITE FORM OR WHITE RABBIT EARS





OPUNTIA MICRODASYS VAR. ALBISPINA

WHITE FORM

OR WHITE RABBIT EARS





OPUNTIA MICRODASYS

RED FORM OR CINNAMAN RABBIT EARS

COVERED IN
DECIDUOUS
GLOCHIDS





OPUNTIA MOJAVENSIS

SEARCHLIGHT CACTUS





OPUNTIA PARAGUAYENSIS

ORANGE TUNA

**THIS NAME WAS
DERIVED FROM TUNAS
THE NAME GIVEN THE
FRUIT IN THE 1500'S**





OPUNTIA POLYACANTHA

GRIZZLY BEAR PRICKLY PEAR





OPUNTIA ROBUSTA

SILVER DOLLAR

VERY LARGE PADS





OPUNTIA RUFIDA

BLIND PRICKLY PEAR

32 TO 36 INCHES
PROTECT FROM FREEZES





OPUNTIA VIOLACEA MACROCENTRA

LARGE NEEDLED PURPLE PANCAKE





OPUNTIA VIOLACEA (MACROCENTRA) SANTA-RITA PURPLE PRICKLY PEAR

PURPLE PADS
IN WINTER OR
UNDER STRESS
GROWS TO 5 FEET
HAS YELLOW FLOWERS



USES OF OPUNTIA OR PRICKLY PEAR CACTUS



THEY ARE USED TO MAKE CANDY, TEA, JAMS AND JELLIES AND ALCOHOLIC DRINKS



NATIVE AMERICANS USED THEM TO TREAT BURNS AND HELP IN CHILD BIRTH



IN MEXICAN FOLK MEDICINE USED FOR DIABETES, ULCERS, AND INFLAMMATION



WHEN PLANTED ON SLOPES, THEY HELP CONTROL EROSION



OREOCEREUS SPECIES

HAIRY OLD MAN

NATIVE TO PERU, CHILE
BOLIVIA AND ARGENTINA



OREOCEREUS
TROLLII





PACHYCEREUS PRINGLEI CARDON



**A 10 YEAR OLD SAGUARO COMPARED TO
A 10 YEAR OLD CARDON**

<http://vimeo.com/14717792>



PACHYCEREUS MARGINATUS

MEXICAN FENCE POST

USE ONLY ROCK MULCH NOT
ORGANIC WITH CACTUS





AS A FENCE

FENCE POST CACTUS IN A NURSERY



PACHYCEREUS MARGINATUS

MEXICAN FENCE POST



PACHYCEREUS MARGINATUS

MEXICAN FENCE POST





PITAYA DULCE ORGAN PIPE CACTUS





PENIOCEREUS GREGGII

QUEEN OF THE NIGHT



**PROTECT
FROM HARD
FREEZES**



PHOTO JACK KELLY UA





STENOCEREUS ALAMOSSENSIS

OCTOPUS CACTUS





TEPHROCACTUS ARTICULATUS (~~OPUNTIA~~ DIADEMATA)

PAPER-SPINE CHOLLA

THE LESS ARMED
OF THE CHOLLAS





TEPHROCACTUS ARTICULATUS DIADEMATUS

(OPUNTIA DIADEMATA)

THE LESS ARMED
OF THE CHOLLAS

SPRUCE CONE CHOLLA



TRICHOCEREUS CANDICANS



**Trichocereus
grandiflorous**



TRICHOOCEREUS HYBRIDS

(ECHINOPSIS)











TRICHOCEREUS PACHANOI

SAN PEDRO CACTUS

UP TO 6 FEET TALL
WHITE FLOWERS AT
NIGHT



TRICHOCEREUS
PERUVIANUS
SAN PEDRO MACHO



TRICHOOCEREUS TERSCHECKII

GOLDEN SAGUARO





TRICHOOCEREUS TERSCHECKII

GOLDEN SAGUARO





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Garden Center at Lorenzi Park
(enter on Twin Lakes)

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(702) 656 1786

SUSAN@CSSSN.ORG

THE CACTUS CLUB OF SOUTHERN NEVADA



CSSSN

Dedicated to educate our members, people of the community, and all interested persons in the appreciation and growth of cacti and succulents.

As part of our mission, we encourage conservation of water through planting desert adapted species.

So, are you into -
Cactus and succulents? Hiking and photography?
Sustainable desert living?

Then join us on the first Thursday of every month at 7:00 pm
WE WANT TO SEE YOU!



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- JAN EMMING YUCCA AZ



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