DESERT BIOSCAPE

A SUSTAINABLE URBAN HORTICULTURAL SYSTEM

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COOP EXTENSION

Questions for desert Bio

1. Southern Nevada receives how much rain fall each year
   a. 10 inches
   b. 12 inches
   c. Less than 5 inches
   d. Almost no rain or snow

2. Over $30 billion are spent annually in the USA on nearly 30 million Acres of lawn. T/F

3. A great garden begins with what?
   a. Healthy living soil
   b. An expensive landscape garden designer
   c. lots of fertilizer
   d. none of the above

4. If you moved to a new area what is the best way to determine what to do in your new yard.
   a. Order landscape books from other parts of the country.
   b. Observe undisturbed areas that exist naturally in the surrounding countryside.
   c. Ask the local chain store clerk what they think.
   d. Observe other landscapes including abandoned properties and try to determine what seems to be working. b and d

5. One of the first things you should learn when doing natural pest control is to identify insects and other organisms correctly and know which are harmful and which are helpful. T/F
6. A well-planned and planted garden/yard will attract desirable wildlife. T/F
7. Shade is an important part of a garden because it
   a. saves water
   b. saves energy
   c. provides relief from heat for people, plants and animals
   d. all of the above
8. T/F Sustainability in landscaping means there are less imputes from outside of the property than being produced on site. Such as making compost and using organic mulch rather than using just chemical fertilizers. Planting native and native like plants that use less water, fertilizer and pesticides.

INTRODUCTION

- **THE GOAL: TO BECOME CITIES OF THE DESERT INSTEAD OF CITIES IN THE DESERT**

A MORE ENVIRONMENTALLY FRIENDLY WORLD BEGINS IN OUR OWN LANDSCAPE, FOR THERE WE CAN MAKE A REAL DIFFERENCE

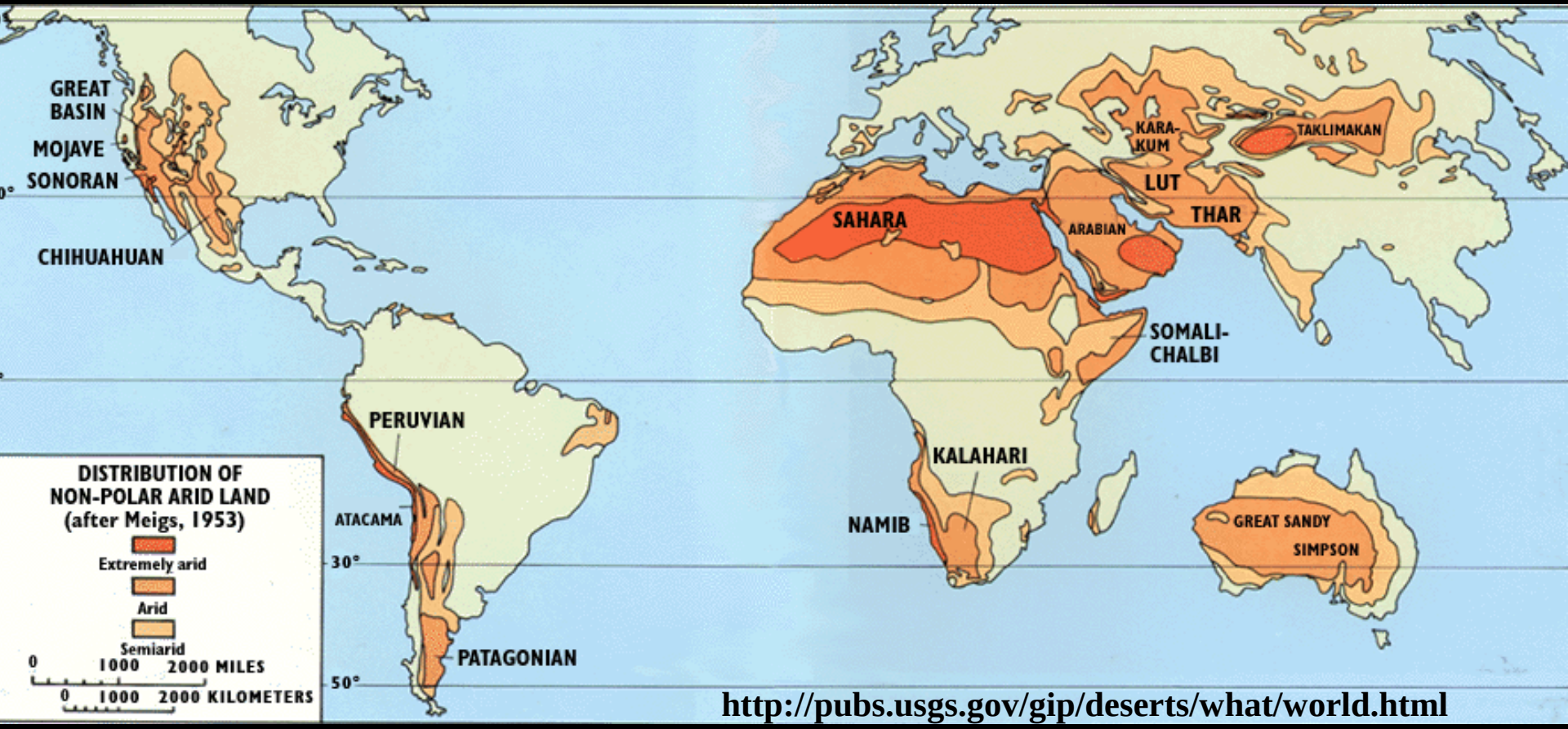
THE MOST NOTEWORTHY THING ABOUT GARDENERS IS THAT THEY ARE ALWAYS OPTIMISTIC, ALWAYS ENTERPRISING, AND NEVER SATISFIED. THEY ALWAYS LOOK FORWARD TO DOING SOMETHING BETTER THAN THEY HAVE EVER DONE BEFORE.—VITA SACKVILLE-WEST

WHAT IS A DESERT?

A DESERT IS….

- DRY. NOT ONLY IS THERE LITTLE RAINFALL, BUT THE POTENTIAL LOSS FROM EVAPORATION GREATLY EXCEEDS PRECIPITATION.
- NOT USUALLY DESERTED. DESERT PLANTS AND ANIMALS ARE WELL SUITED TO ITS CONDITIONS.
- ABOUT 14% OF THE WORLD'S LAND SURFACE.


Wikipedia



http://pubs.usgs.gov/gip/deserts/what/world.html


WATER
A WORLD WIDE CONCERN

WATER AND THE MOJAVE

- 60% OF THE WATER CONSUMED IS USED IN THE LANDSCAPE
- THE MOJAVE DESERT RECEIVES 4 INCHES OF RAIN A YEAR
- THE MOJAVE'S EVAPORATION RATE IS OVER 80 INCHES A YEAR


WATER MAKES THE DIFFERENCE

CONSERVATION FOR NOW AND THE FUTURE

IT CAN BE A DESERT OUT THERE

IF YOU DON'T KNOW WHAT TO DO

SUSTAINABLE HORTICULTURE

- IS GARDENING USING PRINCIPLES OF ECOLOGY.
- INTEGRATES BEST GARDENING/HORTICULTURAL PRINCIPLES AND PRACTICES.
- IS SITE-SPECIFIC APPLICATION THAT WILL LAST OVER A LONG PERIOD OF TIME.
- IS ENHANCED ENVIRONMENTAL QUALITY AND NATURAL RESOURCES IN RELATIONSHIP TO THE OVERALL LANDSCAPE.
- IS THE MOST EFFICIENT USE OF NON-RENEWABLE RESOURCES .
- IS INTEGRATING WHERE APPROPRIATE NATURAL BIOLOGICAL CYCLES AND MANAGEMENT PRINCIPLES.
- IS ENHANCED QUALITY OF LIFE AND SOCIETY AS A WHOLE.

ADAPTED FROM WIKIPEDIA.ORG SUSTAINABLE AGRICULTURE AND HORTICULTURE

SUSTAINABLE HORTICULTURE

SITE PRINCIPLES

- DO NOT HARM THE ENVIRONMENT.
- USE PRECAUTIONARY PRINCIPLES.
- WHEN DESIGNING TAKE THE NATURAL ENVIRONMENT AND CULTURAL PRACTICES INTO CONSIDERATION.
- USE A DECISION-MAKING HIERARCHY OF PRESERVATION, CONSERVATION, AND REGENERATION.
- PROVIDE REGENERATIVE SYSTEMS.
- SUPPORT A LIVING PROCESS (ECOSYSTEM).
- TRY TO USE A COLLABORATIVE AND ETHICAL APPROACH.

ADAPTED FROM WIKIPEDIA.ORG SUSTAINABLE AGRICULTURE AND HORTICULTURE

SUSTAINABLE HORTICULTURE

INPUTS AND OUTPUTS SHOULD BE EQUAL.

YARD WASTE, HOUSEHOLD/FOOD WASTE

OUTPUTS

WATER RUNOFF ,

UNUSED CHEMICALS, OLD POTTING SOIL

FUEL, WATER, FERTILIZER, PESTICIDES , OTHER CHEMICALS,

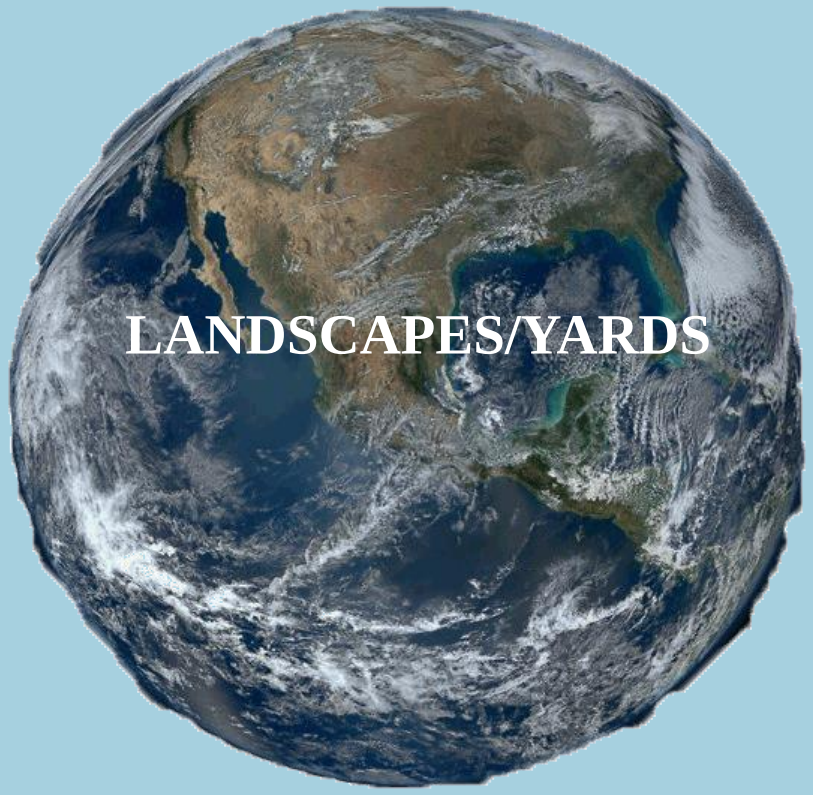
INPUTS

EQUIPMENT, PLANT MATERIALS, SOIL, MULCH, COMPOST

THE GOAL IS TO REDUCE BOTH THE INPUTS AND OUTPUTS.

SUSTAINABLE HORTICULTURE WHAT IS IT?

- **WORKING WITH NATURE RATHER THAN AGAINST IT.**
- **CREATING HEALTHY URBAN ECO SYSTEMS.**




1.5 ACRES CAN PRODUCE 37,000 LBS
OF PLANT BASED FOOD
VS.
1.5 ACRES CAN PRODUCE 375 LBS OF MEAT
COWSPIRACY
Oppenlander, Richard A. Less Meat, and Talking Baby Steps Won't Work. Minneapolis, MN : Langdon Street, 2013. Print.

OODSCAPEING GENEVA SWITZERLAND YARD IS A VEG GARDEN
PIRITUAL ECOLOGY

URBAN PLANNING IN DENMARK GROW FOOD SUSTAINABLE
MYSTERIOUS THINGS IN THE WORLD

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FROM GROW FOOD NOT LAWNS

GROW FOOD EVERYWHERE ECOSNIPPETS


GROWING YOUR OWN TOMATOES IS THE BEST WAY TO DEVOTE 3 MONTHS OF YOUR LIFE TO SAVING $2.17

- 67 MILLION POUNDS OF PESTICIDES ARE USED ON HOME YARDS ANNUALLY
- 165 MILLION POUNDS OF PESTICIDES ARE USED ON COMMERCIAL AREAS

(INCLUDING PARKS, SCHOOLS, PLAYING FIELDS, CEMETERIES, COMMERCIAL AND GOVERNMENT LANDSCAPES)

- 30% OF THE NATIONAL WATER SUPPLY IS USED TO IRRIGATE TURF
- 20% TO 50% OF LANDFILL MATERIALS ARE YARD WASTE

WHY CHANGE TO A MORE SUSTAINABLE LANDSCAPE?

- MORE THAN $30 BILLION ARE SPENT ANNUALLY IN THE USA ON 30 MILLION ACRES OF TURF (OR OVER 1 TRILLION LBS OF VEGS. PER YR. OR OVER 3 MILLION AMERICANS PER YEAR {AVERAGE OF 418 LBS/PERSON} USDA)
- MILLIONS OF GALLONS OF GASOLINE ARE USED ANNUALLY TO MOW, BLOW AND EDGE

WHAT IS A GOOD YARD?

- A CENTURY AGO, PEOPLE PULLED GRASS OUT OF YARDS
- WEEDS LIKE DANDELIONS, LAMB'S QUARTER, MALVA, VIOLET AND PURSLANE WERE ALLOWED TO GROW AND WERE USED IN SALADS AND TEAS.
- IN THE 1860"S THE BRITISH ARISTOCRATS BEGAN THE IDEA OF THE REFINED LAWN
- REMEMBER A WEED IS A PLANT WHOSE VIRTUES HAVE NOT YET BEEN DISCOVERED (RALPH EMERSON)

TOPICS THAT SHOULD BE CONSIDERED

- HEALTHY SOILS
- NATURAL PEST MANAGEMENT
- CORRECT PLANT SELECTION
- PLANTING CORRECTLY
- ENERGY CONSERVATION/SHADE

TOPICS THAT SHOULD BE CONSIDERED

- PRUNING CORRECTLY
- WATER IN THE LANDSCAPE
- IRRIGATION
- WATER HARVEST
- WILD LIFE HABITAT

A GREAT GARDEN BEGINS WITH A GREAT SOIL

- MULCH
- COMPOST
- EARTHWORMS (REMEMBER THEY ARE OUR FRIENDS)
- MICROORGANISMS

GARDENING IN THE SOUTHWEST IS NOT EASY

COMPOSTING AND ORGANIC MULCHING IS DUPLICATING NATURE

A GREAT GARDEN BEGINS WITH A GREAT SOIL

AN ACRE OF LAND WILL SUPPORT ONE OR TWO LARGE FARM ANIMALS

BUT A HEALTHY SOIL CAN SUPPORT 2 TONS OF EARTH WORMS AND ANOTHER 2 TONS OF BACTERIA, FUNGI, AND SOIL ANIMALS BELOW GROUND

COMPOSTING

COMPOSTERS COME IN ALL SHAPES

AND STYLES

COMPOSTING

COMPOSTERS COME IN ALL SHAPES

AND STYLES

COMMERCIAL COMPOSTING

BOTANICAL GARDEN
YARD WASTE
RECYCLING / COMPOSTING

BOTANICAL GARDEN YARD WASTE RECLINING/ COMPOSTING

BATH

Garden Center and Nursery

Compost Tea $4.99

Compost tea is a living soil amendment that instantly begins feeding plants and balancing the soil. It is without a doubt the best natural soil amendment-ever. It offers the same benefits of compost in a more manageable form and boosts the number and diversity of microorganisms in your soil. We use compost from our worm composter and add molasses and kelp meal.

REMEMBER:

- The tea is living—store in a cool place away from sunlight.
- Apply tea the same day you purchase it for best results, as it will become less oxygenated over time.
- To use as a foliar spray, apply in the morning or evening to limit effect of UV rays.
- Use at full-strength for garden plants, or dilute 50/50 with water to cover a larg
- Re-use the c

CHIPPING REDUCES SIZE AND SPEEDS DECOMPOSITION

HOW LONG DOES IT TAKE TO DECOMPOSE

Paper Towel	- 2-4 weeks
Banana Peel	- 3-4 weeks
Paper Bag	- 1 month
Newspaper	- 1.5 months
Apple Core	- 2 months
Cardboard	- 2 months
Cotton Glove	- 3 months
Orange peels	- 6 months
Plywood	- 1-3 years
Wool Sock	- 1-5 years
Milk Cartons	- 5 years

Cigarette Butts	- 10-12 years
Leather shoes	- 25-40 years
Tinned Steel Can	- 50 years
Foamed Plastic Cups	- 50 years
Rubber-Boot Sole	- 50-80 years
Plastic containers	- 50-80 years
Aluminum Can	- 200-500 yrs
Plastic Bottles	- 450 years
Disposable Diapers	- 550 years
Monofilament Fishing Line	- 600 years
Plastic Bags	- 200-1000 yrs

MULCHING SAVES WATER AND COOLS THE SOIL

ALWAYS USE PLANT APPROPRIATE MULCH

- EXAMPLES
- CACTUS AND SUCCULENTS ROCK
- MOJAVE DESERT PLANTS ROCK
- PALMS ORGANIC
- MOST TREES AND SHRUBS ORGANIC
- VEGETABLES ORGANIC

TYPES OF MULCH

- CHIPPED YARD WASTE INCLUDING, TREES TRIMMINGS, GRASS CLIPPINGS, BY PRODUCTS SUCH AS NUT HULLS , AND LEAVES
- COMPOST
- PAPER PRODUCES
- NATURAL FIBERS
- LIVE MULCH (SUCH AS GROUND COVERS AND VEGETABLE PLANTS)
- ROCKS AND GRAVEL
- OLD CARPET AND CARDBOARD (ONLY FOR HARD TO KILL INVASIVE WEEDS)

PROBLEMS WITH ORGANIC MULCH

- CAN CATCH ON FIRE (ESPECIALLY WITH CIGARETTES)

SOLUTIONS

A. COMPOST IT MORE
B. OVER HEAD IRRIGATION TO MOISTEN THE SURFACE
C. HAND WATER SURFACE
D. USE A NONTOXIC FIRE RETARDED SPRAY

- WILL BLOW OUT OF BEDS

SOLUTIONS

A. USE LARGER BARK MULCH OR LARGER CHIPS
B. USE SHREDDED MULCH

- FLOATS OUT OF BEDS

SOLUTIONS

A. KEEP SOIL LINE AND MULCH BELOW THE TOP OF THE CURB
B. USE MULCH THAT IS MORE COMPOSTED

ORGANIC MULCH

- LITTER FALL (LEAVES AND TWIGS) ARE NEEDED BY TREES AND SHRUBS AND MICRO-ORGANISMS
- LITTERFALL CAN ELIMINATE FERTILIZATION
- PRODUCES A MORE SUSTAINABLE LANDSCAPE
- TREES AND SHRUBS HAVE
  - 1. ENDOMYCORRHIZAS : A FUGUES THAT DOES NOT FORM A SHEATH AROUND THE ROOTS BUT PENETRATES THE CORTICAL CELLS BUT NOT THE MEMBRANE MORE COMMON THAN ECTO
  - 2. ECTOMYCORRHIZA: FORMS A SHEATH AROUND THE ROOT GREATLY INCREASING THE SURFACE PENETRATES BETWEEN CELLS OF THE CORTEX TO EXCHANGE NUTRIENTS . THEY ARE OUT SIDE OF THE ROOTS AND MORE GENERALIST
  - (TURF HAVE ENDOMYCORRHIZAS OR NON AT ALL)

TREES AND SHRUBS WITH MULCH

- MOST TREES NEED LITTLE TO NO FERTILIZER IF THE TREE HAS SPACE FOR ORGANIC MULCHES
- TURF UNDER TREES WILL USE MOST TO ALL OF THE NITROGEN
- IF TREES AND SHRUBS ARE MULCHED EVERY OTHER IRRIGATION CAN BE SKIPPED
- AFTER A TREE HAS A FULL CANOPY, MULCH DOES NOT SAVE WATER BUT DOES IMPROVE THE SOIL
- MULCH FACILITATES MORE WATER INFILTRATION INTO THE SOIL

TREES AND SHRUBS WITH MULCH

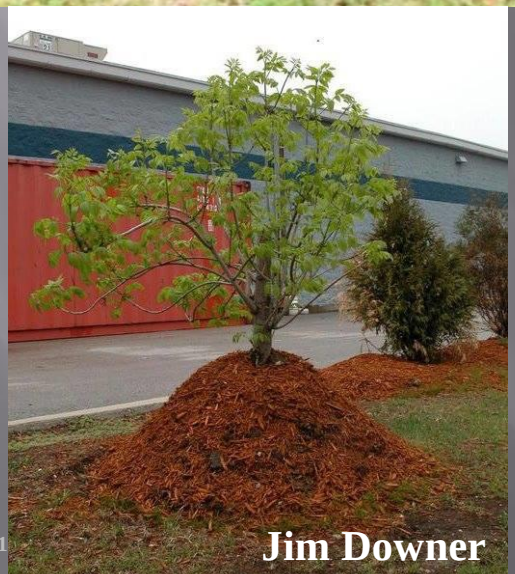
- THE MORE MULCH, THE MORE FERTILITY
- TREE WOOD CHIPS DO NOT DEPLETE NITROGEN
- YARD WASTE MULCH RAISES ACID SOIL pH AND LOWERS ALKALI SOIL pH
- YARD WASTE pH is 6.8
- THE MORE THE MYCORRHIZAS ON THE ROOTS, THE MORE DISEASE PREVENTION
- PRODUCTS CONTAINING MYCORRHIZAS DO NOT WORK BECAUSE THEY DO NOT CHANGE THE SOIL LIKE MULCH

ORGANIC MULCH VS ROCK MULCH

MULCHES

NO MULCH DONUTS

KEEP MULCH AWAY FROM THE TRUNK



Jim Downer

MULCH TO DRIP LINE OR FURTHER


MULCH TO DRIP LINE OR FURTHER

HOW LONG DOES MULCH LAST?

- ORGANIC MULCH SUCH AS YARD WASTE LOSES CARBON AT ABOUT 66% BY WEIGHT PER YEAR. THE RATE OF LOSS DEPENDS ON MOISTURE AND TEMPERATURE
- DON'T PUT MULCH HIGHER THAN THE CURB


DON'T MULCH NEXT TO THE STEM

NATURAL ROCK MULCH VS URBAN ROCK LANDSCAPES

VARIOUS SIZES AND COLORS

ROCK MULCH WILL WASH OUT

MULCHES

MULCHES

SURFACE TEMPERATURES

- ON A 90 f DEGREE DAY (IN ST. GEORGE UT.)
- ARTIFICIAL TURF 168 f
- ROCKS 120 f
- PAVING (BLACKTOP) 120 f
- NATURAL TURF 84 f

10 YEARS OF COMPOSTING AND MULCHING

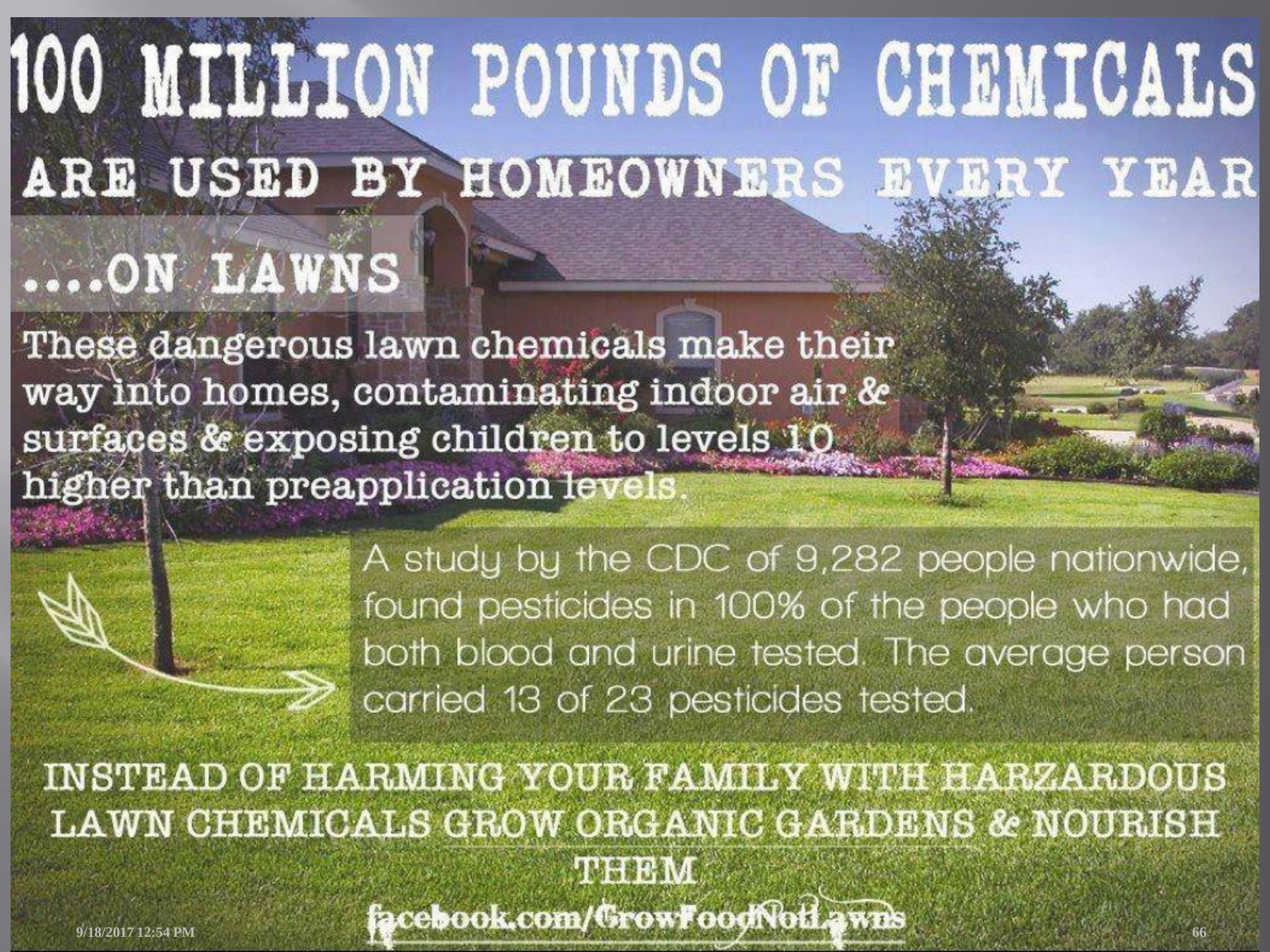
ORGANIC MULCH WILL HELPS HARVEST AND CLEAN WATER

WHY USE NATURAL PEST MANAGEMENT ?
TOXIC GARDENS?

- Three-quarters of American gardening households use lawn and garden chemicals
- National Cancer Institute study found that children whose parents used store-bought home and garden pesticides are up to seven times more likely to develop childhood leukemia

- CHILDREN, ARE MOST AT RISK AND ARE EXPOSED BY ROLLING AROUND IN THE GRASS ETC.

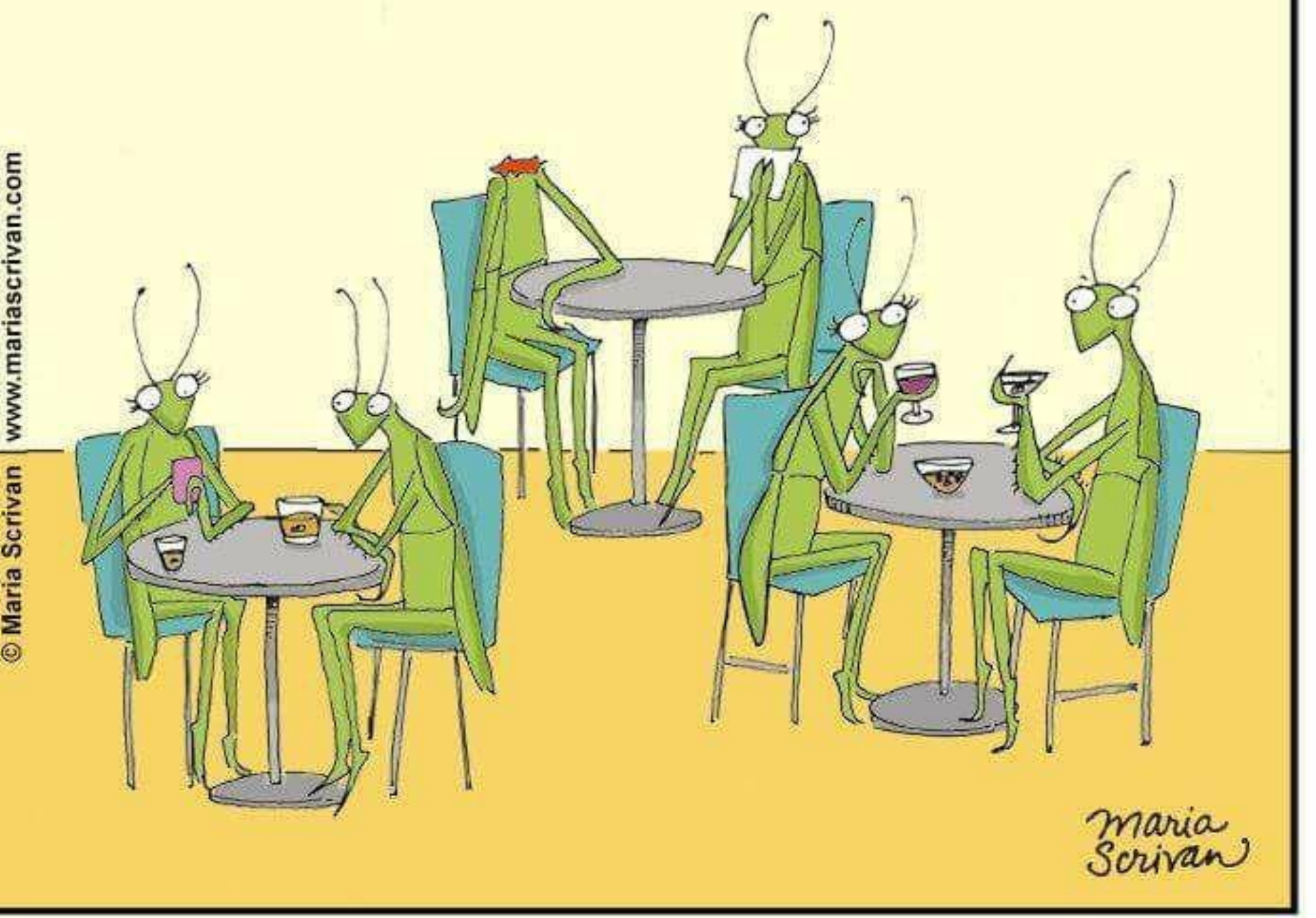
- PROBLEMS INCLUDE LEARNING DISABILITIES, BEHAVIORAL PROBLEMS AND PROBABLY CANCER AND OTHER CHRONIC DISEASES IN CHILDHOOD AND IN ADULT LIFE
- PESTICIDE EXPOSURE HAS ALSO BEEN LINKED TO BREAST AND PROSTATE CANCER, PARKINSON'S DISEASE AND IMMUNE SYSTEM DISORDERS.


100 MILLION POUNDS OF CHEMICALS
ARE USED BY HOMEOWNERS EVERY YEAR
....ON LAWNS
These dangerous lawn chemicals make their way into homes, contaminating indoor air & surfaces & exposing children to levels 10 higher than preapplication levels.
A study by the CDC of 9,282 people nationwide, found pesticides in 100% of the people who had both blood and urine tested. The average person carried 13 of 23 pesticides tested.
INSTEAD OF HARMING YOUR FAMILY WITH HARZARDOUS LAWN CHEMICALS GROW ORGANIC GARDENS & NOURISH THEM
facebook.com/GrowFoodNotLawns

NATURAL PEST CONTROL

- SAVES MONEY
- PROTECTS THE ENVIRONMENT
- PROTECTS NATURAL PREDATORS (BENEFICIALS)
- STOPS THE CONTAMINATION OF SURFACE AND GROUND WATER
- SAVE ENERGY

KNOW THE PEST FROM THE BENEFICIALS



Speed Dating

USE TRAPS AND NATURAL PREDATORS

THE FARMACY

LEARN FROM OBSERVING NATURAL AREAS NEAR YOUR HOME

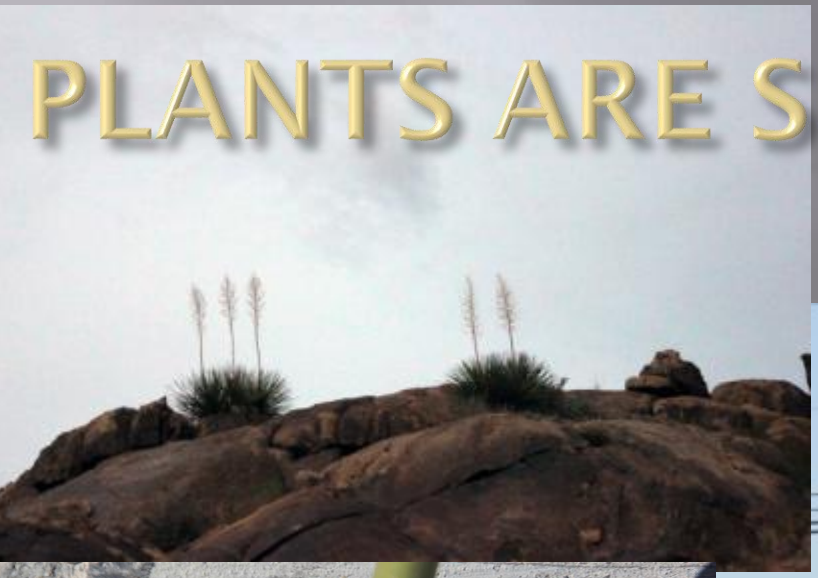
- IN NATURE, PLANTS ARE GROUPED ACCORDING TO NEEDS-WATER, SUNLIGHT, SOIL TYPE, ETC.

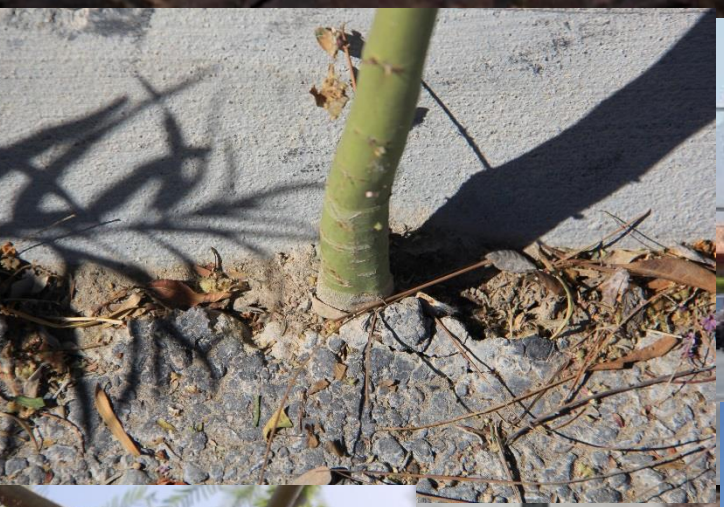
"WHY SEND TO EUROPE'S (OR ANY WHERE ELSE) DISTANT SHORES/FOR PLANTS WHICH GROW AT OUR OWN DOORS?" (SHAKER HERB CATALOG 1833)

LEARN FROM OBSERVING VACANT HOMES IN YOUR AREA

- SEE WHAT PLANTS ARE SURVIVING WITHOUT CARE
- SEE WHAT PLANTS ARE SURVIVING WITHOUT WATER TRY TO FIND OUT HOW LONG THE WATER HAS BEEN OFF (MAKE NOTES OF WHAT YOU SEE AND WHEN)

PLANTS ARE SURVIVORS





PLANTS ARE SURVIVORS

MORE WATER EQUALS MORE PLANTS

URBAN LANDSCAPE DESIGNED

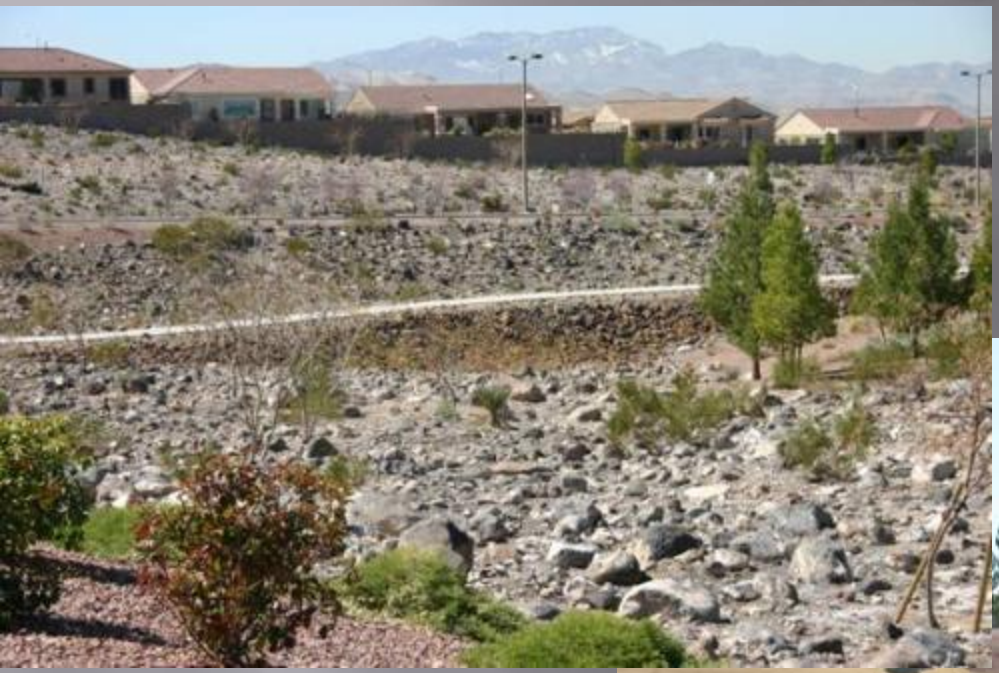
WASHES

URBAN LANDSCAPE

NATURAL AREAS

NATURAL AREAS DUPLICATED IN THE LANDSCAPE

INCORPORATING NATIVE LANDSCAPE



WITH DESIGNED NATIVE LANDSCAPES

PLANTING CORRECTLY

DIG THE HOLE TWO TO THREE TIMES THE SIZE OF THE ROOT BALL

FILL WITH WATER AND TIME TO CHECK THE DRAINAGE

AFTER PLANTING MAKING A BERM AROUND THE ROOT BALL AREA TO HOLD IRRIGATION WATER

FILL THE HOLE AGAIN WITH WATER AND TIME

IF IT TAKES LONGER THAN A FEW HOURS YOU HAVE A DRAINAGE PROBLEM

HAND WATER IN WHILE PLANTING OR SOON AFTER

HAND WATER EVERY FEW DAYS DEPENDING ON THE TIME OF YEAR FOR 6 TO 12 MONTHS

A DRY ROOT BALL IS DIFFICULT TO WET AFTER PLANTING

WATER CONTAINER WELL SO THE ROOT BALL IS MOIST

BACK FILL WITH SOIL CAVING IN THE SIDES TO FILL GAPS BETWEEN THE ROOT BALL AND HOLE. THIS ALSO BEGINS THE BERM THAT WILL HOLD WATER

HAND WATERING MAKES SURE ALL AIR POCKETS ARE ELIMINATED

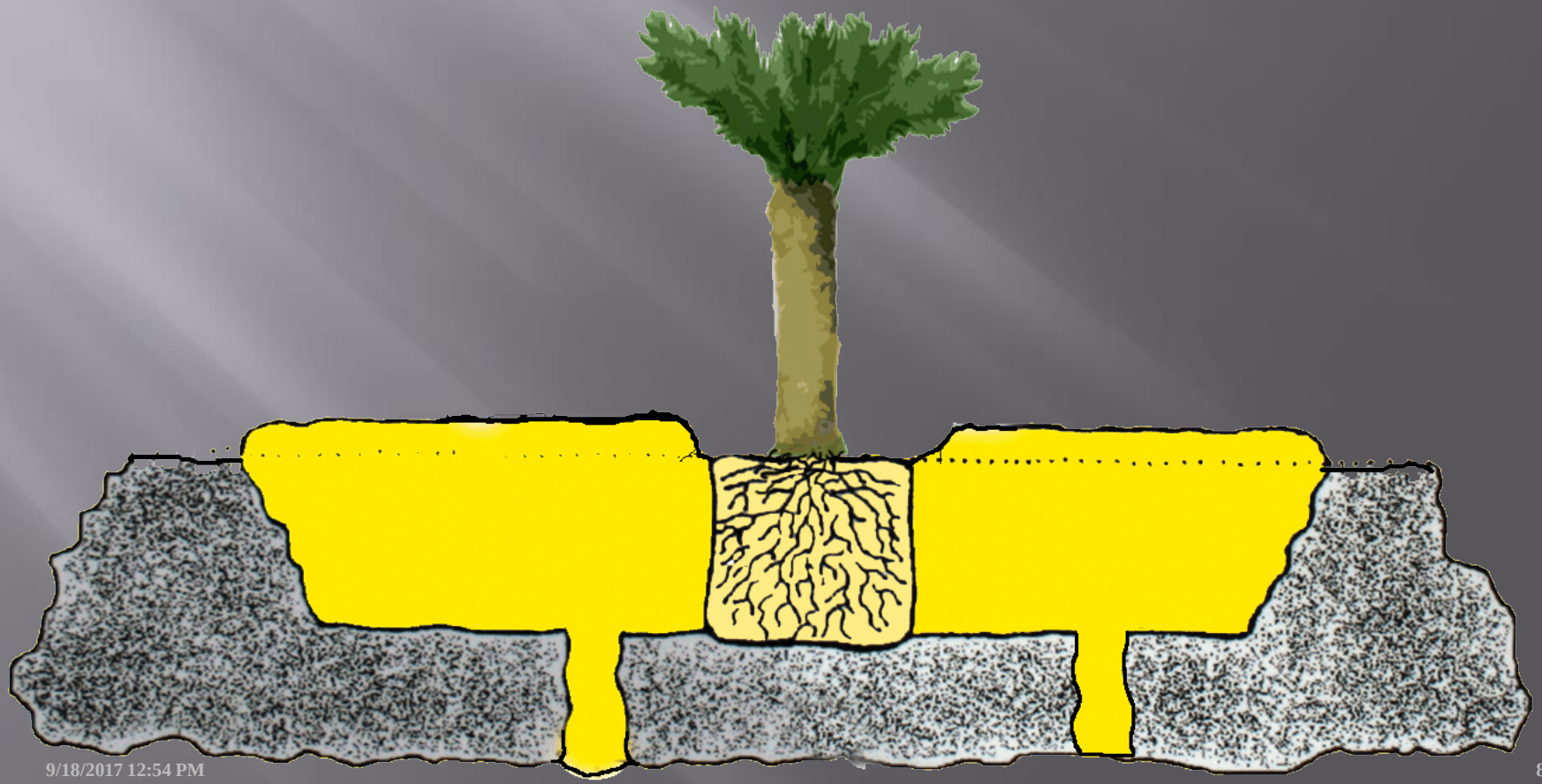
BUBBLES ARE GOOD

HAND WATER 2 OR 3 TIMES A WEEK DEPENDING ON THE TIME OF YEAR

NATIVE PLANTS WITH SENSITIVE OR POORLY DEVELOPED ROOT SYSTEMS MAY NEED THE BOTTOM CUT OFF THE POT BEFORE PLACING IT IN THE HOLE AFTER THE WATER HAS DRAINED (THE POT BOTTOM CAN REMAIN IN THE HOLE)

IF THE POT DOES NOT SLIP OFF EASLEY CUT ONE OR TWO SIDES TO FACILITATE ITS REMOVAL

IF THE DRAINAGE IS POOR A CHIMNEY CAN BE ADDED THAT IS DEEPER THAN THE HARDPAN THAT PREVENTS PERCOLATION TO PROVIDE GOOD DRAINAGE



NATIVE AND NATIVE LIKE PLANTS

- **SLEEP**
- **CREEP**
- **LEAP**

WHEN THEY ARE PLANTED

SLEEP:

DEVELOPING ROOT SYSTEM (50% OF THE ROOT SYSTEM SHOULD BE OUTSIDE OF THE ORIGINAL ROOT BALL IN 6 MONTHS TO 1 YEAR IS THE GOAL)

CREEP:

THE PLANT CONTINUES TO DEVELOP IT'S ROOT SYSTEM AND BEGINS ABOVE GROUND GROWTH TO SUPPORT IT

LEAP:

ONCE A GOOD FOUNDATION HAS BEEN ESTABLISHED PLANT GROW ACCELERATES ABOVE AND BELOW GROUND

AL SAYS IT IS TIME FOR A BITE

PLANTS SHOULD PROVIDE

- FOOD
- COVER/SHELTER
- NESTING AREAS

GOOD PLANNING AND PLANTING ATTRACTS DESIRABLE WILDLIFE

PLANTING FOOD PLANTS

- **5 TO 10 TIMES AS MANY SPECIES OF BIRDS WILL COME TO A PLANTED landscape AS WILL TO A BIRD FEEDER**

WILDLIFE FEEDERS

PIGEONS

PIGEONS GUARDS

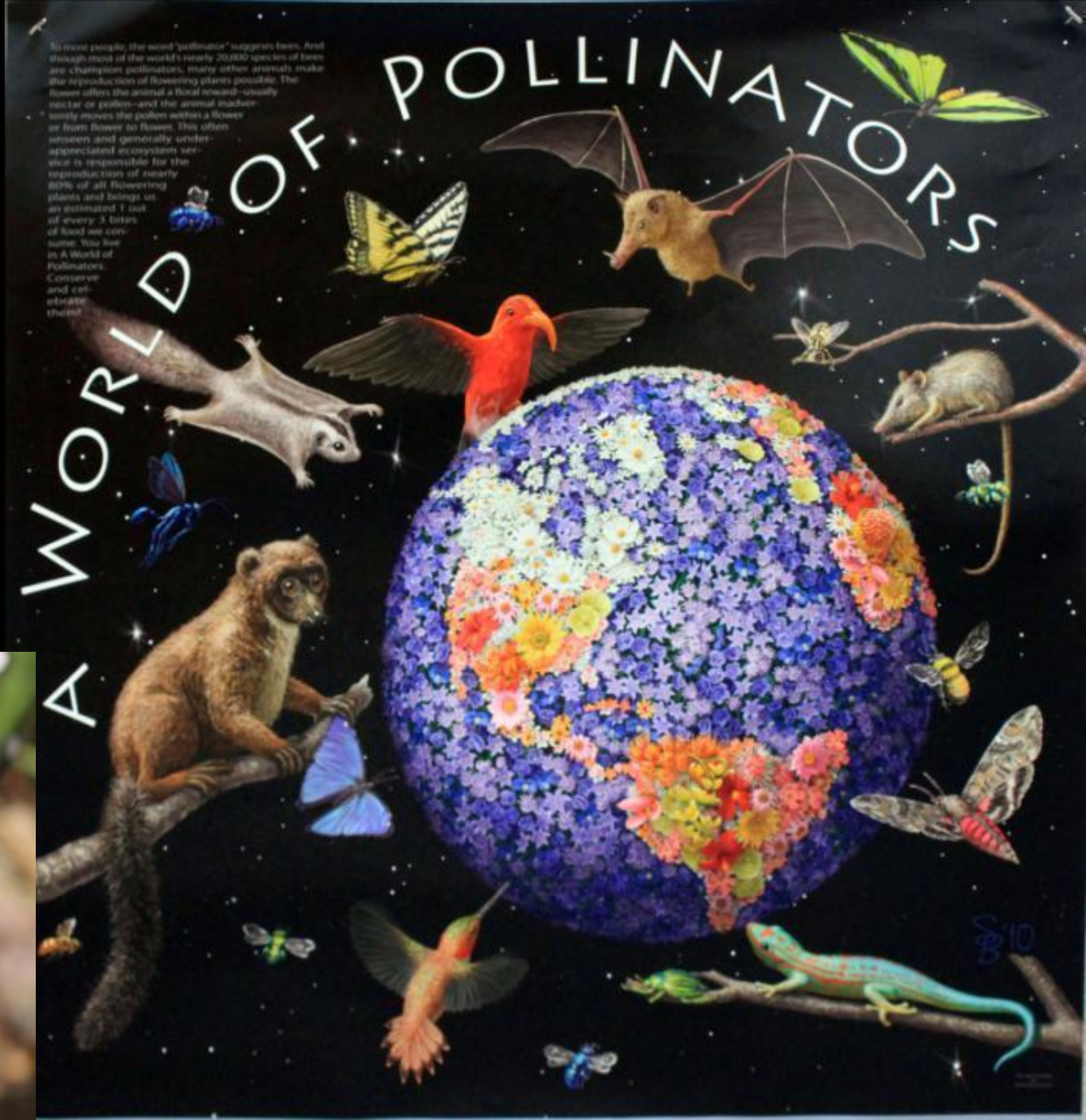
BIRD FEEDERS AND BATHS CAN ADD TO A WELL PLANTED landscape

FOOD PLANTS


Cooperative Extension

A WELL PLANTED LANDSCAPE WILL ATTRACT MORE ANIMALS

BEES ARE NOT THE ONLY POLLINATORS



POLLINATOR HOMES

BEE BLOCKS AND PITHY STEMS

BUTTERFLY HOUSE

THE LANDSCAPE MAY BE FOR ONE SPECIES

BAT HOUSES

THE ONLY BAT THAT HAS COME TO MY BAT HOUSE

PRUNING
DO IT RIGHT

HEDGE SHRUBS GARDENING

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WOW AMAZING

PRUNE CORRECTLY

SHRUBS

PRUNE CORRECTLY HELPS SAVE WATER

PRUNE CORRECTLY

PRUNE CORRECTLY

DETERMINE NEW SIZE

REACH INSIDE TO MAKE THE CUTS

PRUNE CORRECTLY

BEFORE

AFTER

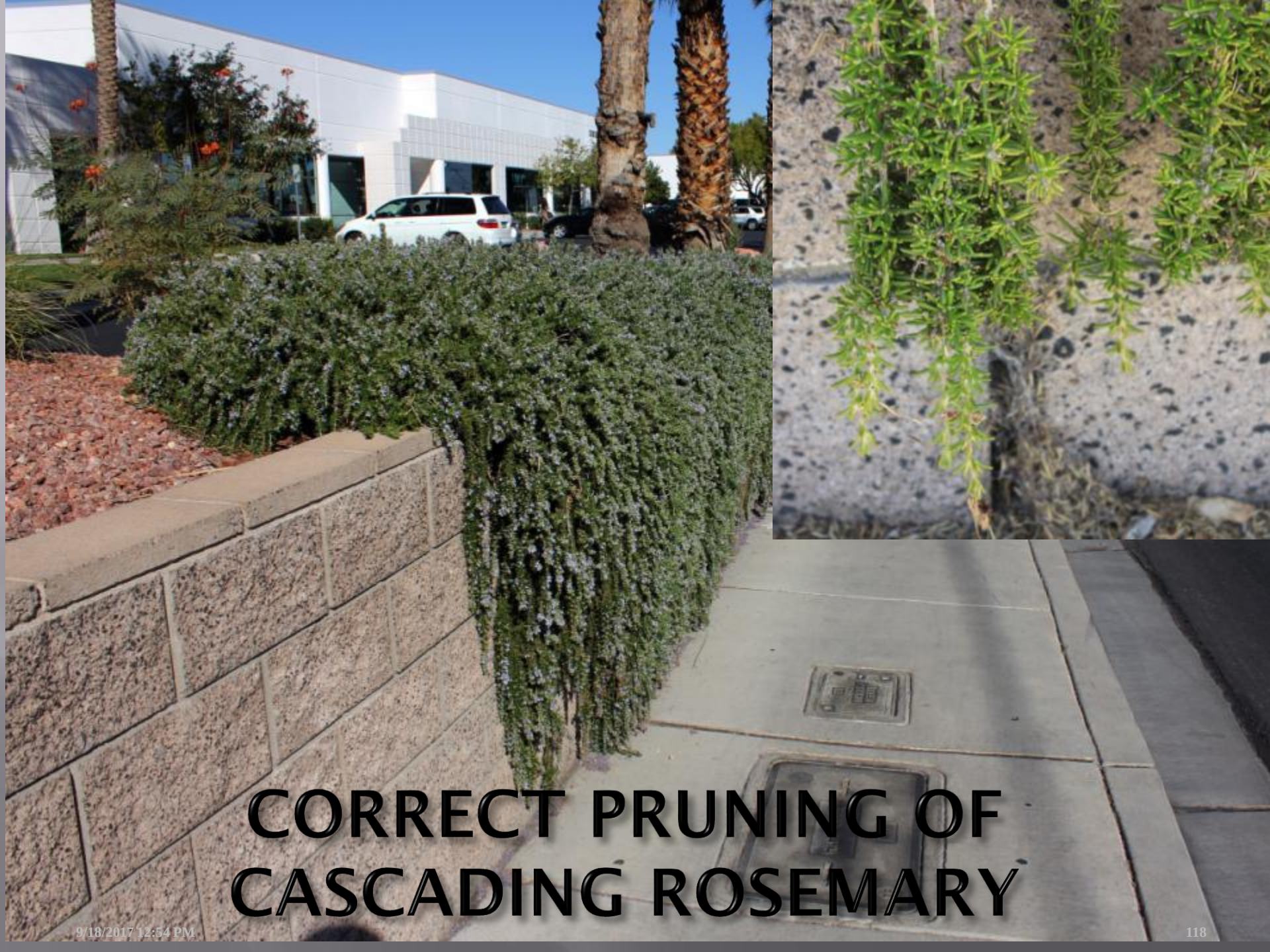
PRUNING TO THE GROUND

MARCH

JUNE

PRUNING TO THE GROUND

SEPTEMBER



CORRECT PRUNING OF CASCADING ROSEMARY


LET IT GROW

CORRECT PRUNING BEGINS WITH GOOD PLANING

CORRECT PRUNING BEGINS WITH GOOD PLANING

GOOD PRUNING BEGINS WITH CHOOSING THE RIGHT PLANT AND THE RIGHT SPACING

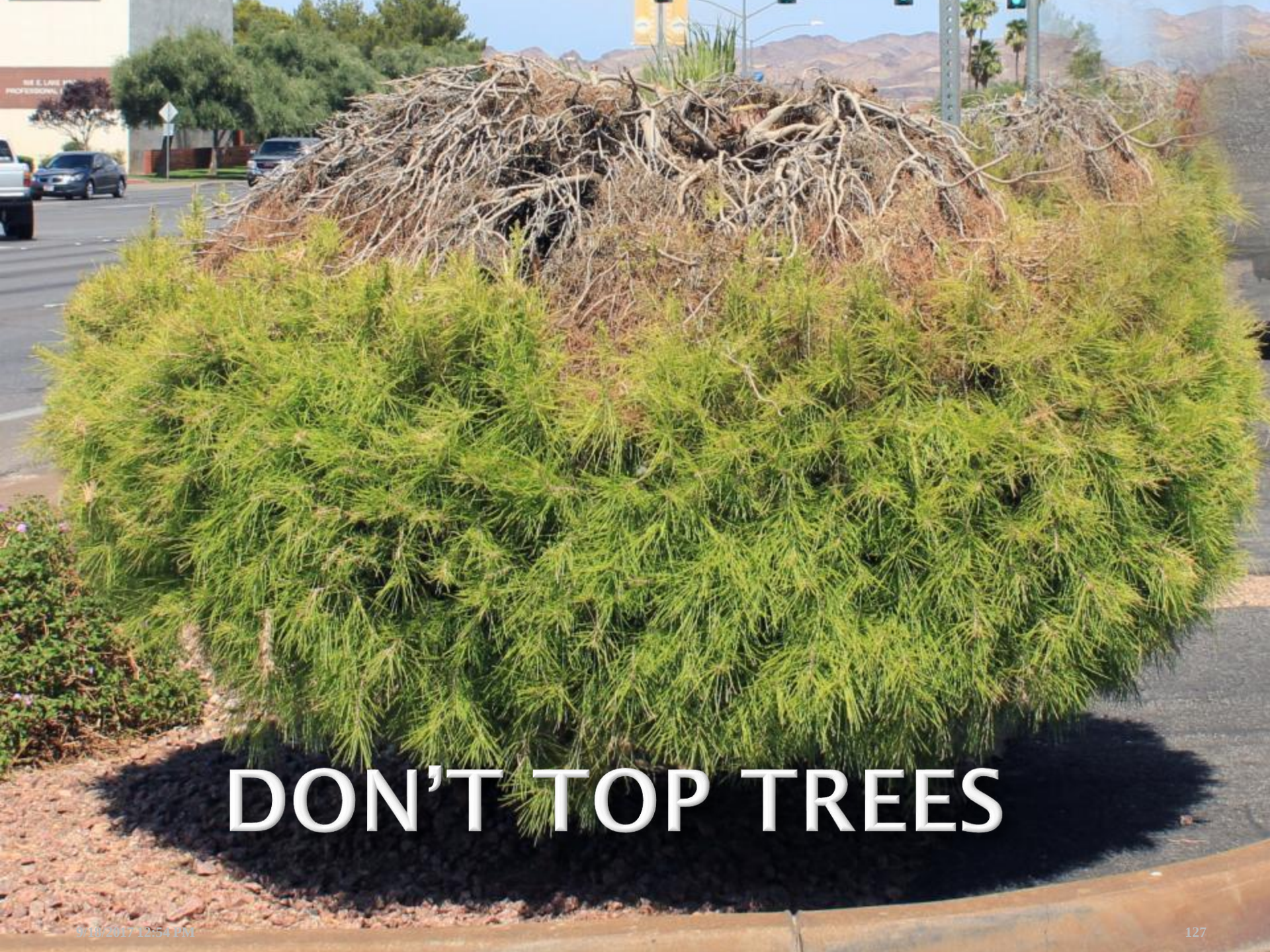
DON'T ABUSE NATIVE PLANTS WITH POOR PRUNING

DON'T OVER PRUNE

DON'T TOP TREES

DON'T TOP TREES

2 WEEKS LATER


DON'T TOP TREES

MICROCLIMATES

- A MICROCLIMATE IS AN AREA WHERE THE CLIMATE (TEMPERATURE, LIGHT, HUMIDITY, ETC.) DIFFERS FROM THE SURROUNDING AREA
- IT MAY BE AS SMALL AS A FEW SQUARE FEET SUCH AS THE SOUTH SIDE OF A BUILDING OR UNDER A TREE.
- IT MAY BE AS LARGE AS SEVERAL SQUARE MILES SUCH AS A VALLEY OR SHORELINE OF A LAKE

SOUTH SIDE OF A HOUSE

MICROCLIMATES

PROTECTED BY THE HOUSE AND WALL

HEAT BUILD UP FROM THE HOUSE AND WALL

MICROCLIMATES AND COLD PROTECTION

PROTECTION FROM THE DEAD FOLIAGE AND HEAT FROM THE SIDEWALK

PROTECTED BY THE PALM LEAVES

CITRUS TREES PLANTE ON THE SOUTHWEST WALL OF A HOUSE

A RUBBER TREE (FICUS ELASTICA) PLANTE ON THE SOUTHWEST WALL OF A COURT YARD

INTERIOR PLANTS ASPIDISTRA, KENTIA AND RHAPIS PALMS PLANTED IN SHADED OUTDOOR BEDS INTERIORSCAPE

A SMALL TEMPORARY GREENHOUSE CAN BE MICRO-CLIMATE

A CREATED MICROCLIMATE IN A COURT YARD OF ANCIENT EGYPT

SHADE IN THE GARDEN

- SAVES WATER
- SAVES ENERGY
- PROVIDES RELIEF FROM THE SUMMER HEAT FOR PEOPLE, PLANTS, BUILDINGS AND ANIMALS

SHADE IN THE GARDEN

SHADE IN THE GARDEN

IN MANY DIFFERENT FORMS

SHADE IN THE GARDEN

FOR ANIMALS AND PEOPLE

AND FOR PLANTS

SHADE IN THE GARDEN

FOR PLANTS

COMPARE TO FULL SUN

SHADE IN THE GARDEN

SAVES
ENERGY

SHADE

TREES CAN PROVIDE SHADE THAT WILL COOL THE SURROUNDING AREA UP TO 20 ˚F

TEMPERATURE DIFFERENCES

GREEN PLANTS

DARK WALL

LIGHT COLORED DESERT PLANTS

SHADE AND PLANTS MAKE THE DIFFERENCE

HEAT IN THE GARDEN

PLANT LIKE PLANTS TOGETHER

- CONSIDER THEIR NEEDS
- LIGHT
- WATER
- SOIL TYPE
- DRAINAGE
- WINTER/SUMMER HARDINESS

WATER IN THE LANDSCAPE

- WATER FEATURES SHOULD NOT BE SO LARGE THAT THEY WASTE WATER
- THE SOUND OF RUNNING WATER ATTRACTS WILDLIFE EVEN WHEN THEY CAN'T SEE IT
- CONSTRUCT WATER FEATURES SO THERE ARE NO LEAKS TO WASTE WATER

- USE TIMERS TO RUN WATER FEATURES ONLY DURING LOW EVAPORATION TIMES SUCH AS WHEN THERE IS

  LOW OR NO WIND OR IN THE EARLY MORNING OR EVENING
- USE SMALL WATER FEATURES
- LEAK FREE

USE AN IRRIGATION "WIND SHUT OFF DEVICE" TO SAVE WATER DURING HIGH WINDS

WATER FEATURES COME IN ALL SIZES AND SHAPES

SOME WATER FEATURES ARE JUST TOO BIG FOR THE AVERAGE landscape

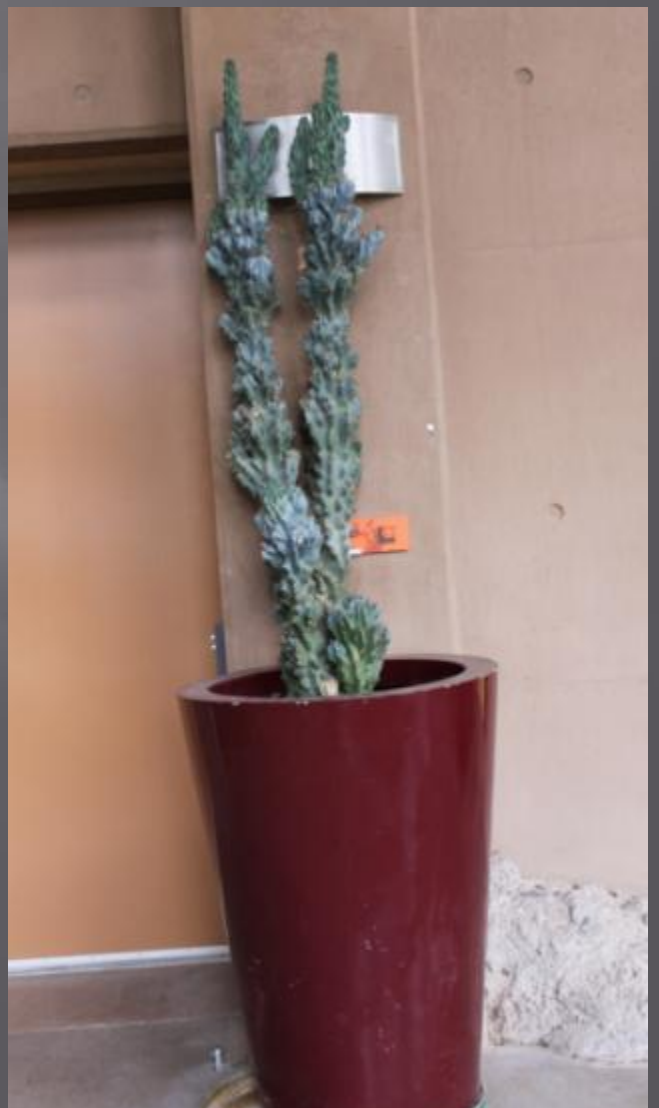
SOME WATER FEATURES ARE JUST TOO BIG FOR THE AVERAGE landscape


WATER IN THIS COURT
YARD LANDSCAPE HELPS
COOLS THE
ENVIRONMENT BY
PROVIDING BOTH
MOISTURE AND SOUND


Fountain Basin

TO SAVE WATER USE DESERT PLANTS FOR CONTAINERS

TO SAVE WATER USE DESERT PLANTS FOR CONTAINERS



TO SAVE WATER USE DESERT PLANTS FOR CONTAINERS


NEED MONEY
FOR MY FAMILY
IN THE RAINFOREST


厕所
TOILET

WATERING

- WATER ONLY AS NEEDED
- WATER LESS IN THE WINTER THAN IN THE SUMMER
- PLANT TREES, SHRUBS, AND GROUND COVERS WITH THE SAME WATER NEEDS TOGETHER

WATERING

- USE LOW VOLUME IRRIGATION WHERE APPROPRIATE
- AS LITTLE AS 2% ORGANIC MATTER IN THE SOIL CAN REDUCE IRRIGATION NEEDS BY 75% OVER POOR SOILS WITH LESS THAN 1% ORGANIC MATTER
- SHADING WITH MULCH AND PLANT LEAVES CAN REDUCE IT BY 60%
- (RAINWATER HARVESTING FOR DRYLANDS AND BEYOND VOLUME 23 PAGE 20)

DO WE WATER TOO MUCH?

- YES, THIS LANDSCAPE SURVIVED FOR OVER ONE YEAR WITH NO IRRIGATION AND ONLY 5 INCHES OF RAINFALL

NAME THAT SHRUB ???

THIS IS A 14 YEAR OLD CREOSOTE BUSH

IT USES LITTLE WATER NO PESTICIDES OR FERTILIZER AND ONLY PRUNED AS NEEDED


CHECK YOUR IRRIGATION SYSTEM OFTEN

WHEN RETROFITTING PUT MAKE SURE THERE IS ADEQUATE IRRIGATION FOR ESTABLISHED TREES AND SHRUBS

ONLY 3 EMITTERS NEXT TO THE TRUNK FOR THIS MATURE TREE


I NEED MORE WATER THAN THAT

DESIGN OF IRRIGATION SYSTEMS

- CALIBRATE SYSTEMS TO KNOW HOW MUCH WATER IS BEING USED IN EACH ZONE
- SEPARATE ZONES FOR TURF, TREES, SHRUBS, AND DESERT PLANTS
- THE SYSTEM NEEDS TO GROW AS THE PLANTS AND TREES GROW

SOMETIMES YOU NEED TO HAND WATER


HOME DEPOT CORDLESS BLUE TOOTH
HOSE IRRIGATION
THE ONION

IS YOUR LANDSCAPE ON LIFE SUPPORT?

A GOOD SIGN YOU ARE OVER WATERING LOOK FOR CATTAILS

WHY WATER HARVEST ?

- WATER HARVESTING REDUCES USE OF POTABLE WATER AND RELATED COSTS.
- IT REDUCES OFF-SITE FLOODING AND EROSION BY HOLDING WATER ON PROPERTY.
- LARGE AMOUNTS HELP RECHARGE WATER TABLES.
- RAINWATER IS SALT-FREE FOR PLANTS.

FROM HARVESTING RAINWATER FOR LANDSCAPE USE UNIVERSITY OF AZ.

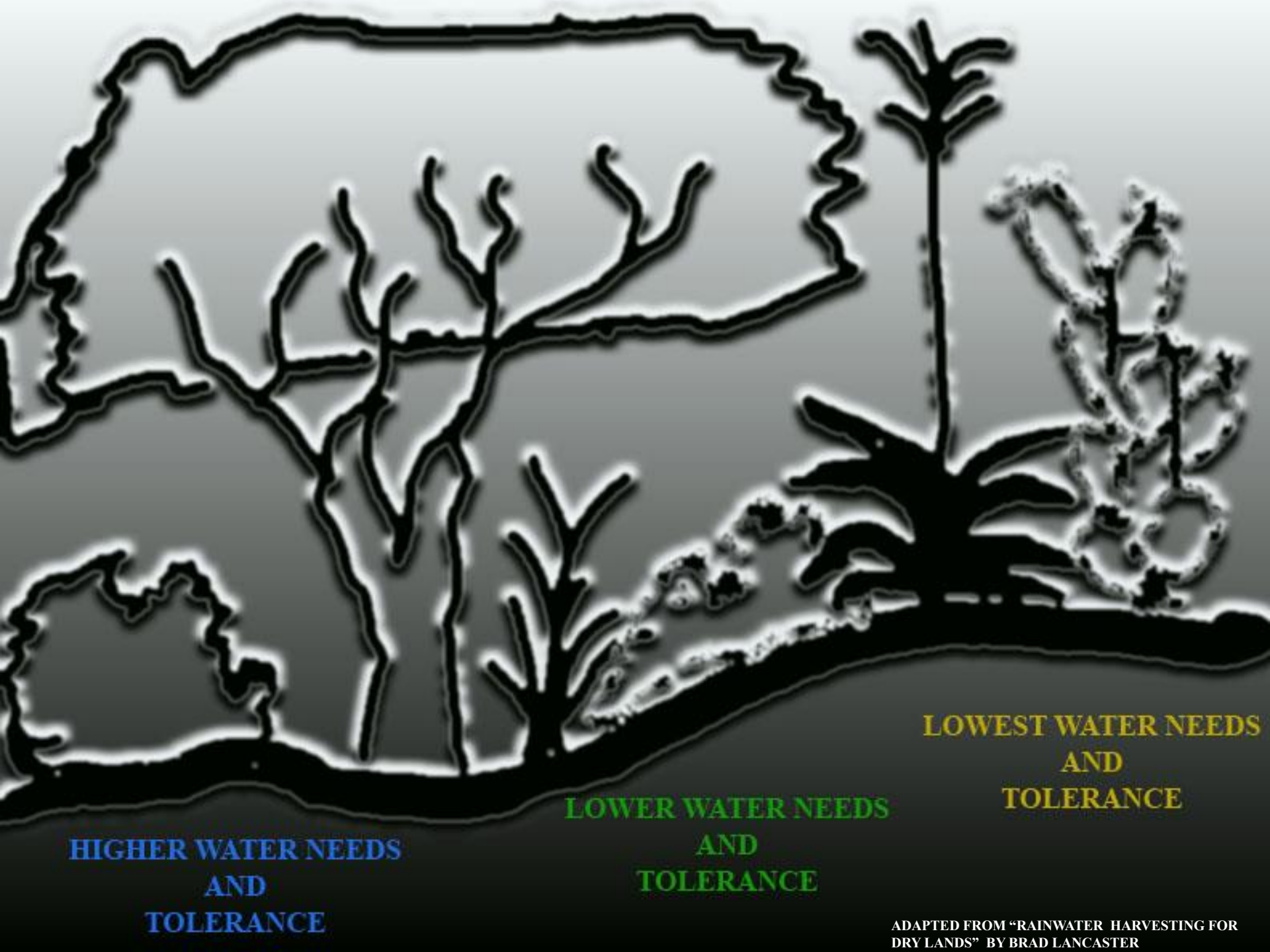
WHY WATER HARVEST ?

- THE AVERAGE SINGLE FAMILY HOME CAN HAVE FROM 25% TO 60% IMPERVIOUS SURFACE AREA INCLUDING THE HOUSE, DRIVE, SIDEWALKS, PATIOS, ETC.

  COMMERCIAL PROPERTIES CAN HAVE UP TO 100%

FOR A METROPOLITAN AREA SUCH AS ATLANTA GA. THIS IS A LOSS OF ENOUGH WATER TO SUPPLE THE NEEDS OF 1.5 TO 3.6 MILLION PEOPLE ANNUALLY

(BRAD LANCASTER, RAINWATER HARVESTING VOLUME 2 PAGE 58)

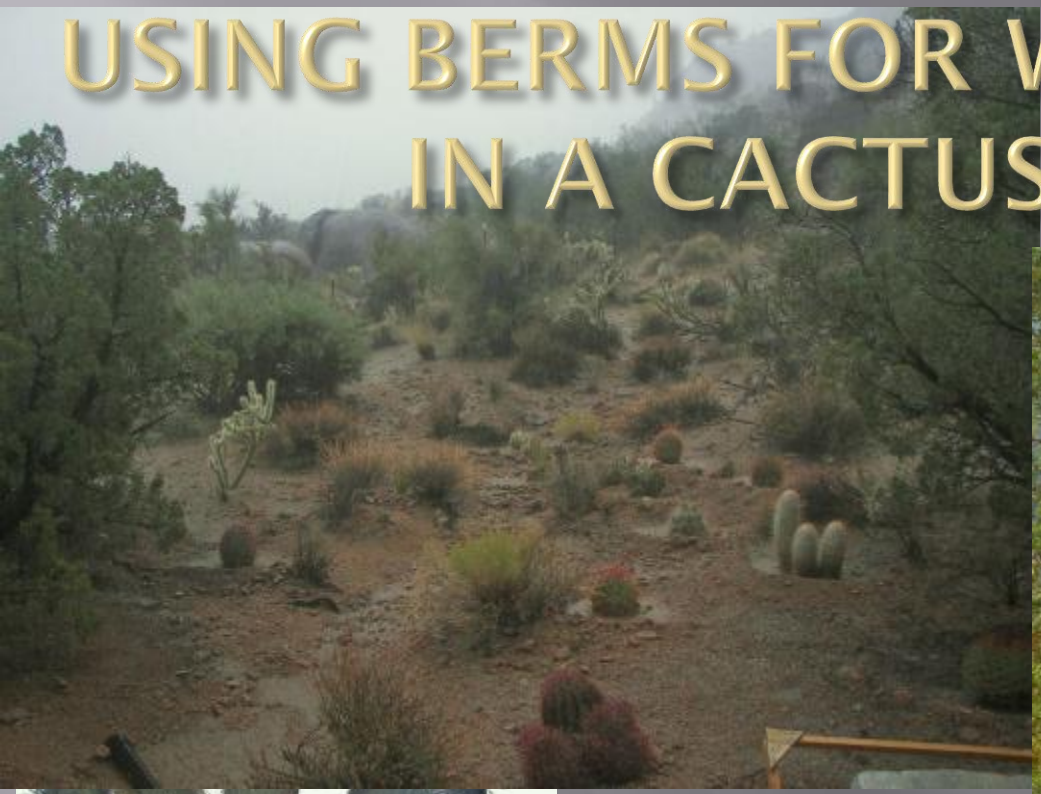


ADAPTED FROM "RAINWATER HARVESTING FOR DRY LANDS" BY BRAD LANCASTER

WATER HARVEST IN THE GARDEN

USING BERMS FOR WATER HARVEST IN A CACTUS GARDEN

USING BERMS FOR WATER HARVEST IN A CACTUS GARDEN



PHOTOS BY JAN EMMING OF HIS RANCH YUCCA AZ.

HOW MUCH WATER CAN YOU HARVEST?

- IN SOUTHERN NEVADA WHICH RECEIVES ONLY 4 INCHES OF RAIN A 1000 SQ. FT. ROOF CAN CAPTURE 2400 GALLONS, OF WATER PER YEAR
- SQ. FT. X .6 X INCHES OF RAIN= GALLONS, OF WATER

FROM HARVESTING RAINWATER FOR LANDSCAPE USE UNIVERSITY OF AZ.

HOW MUCH WATER CAN YOU HARVEST?

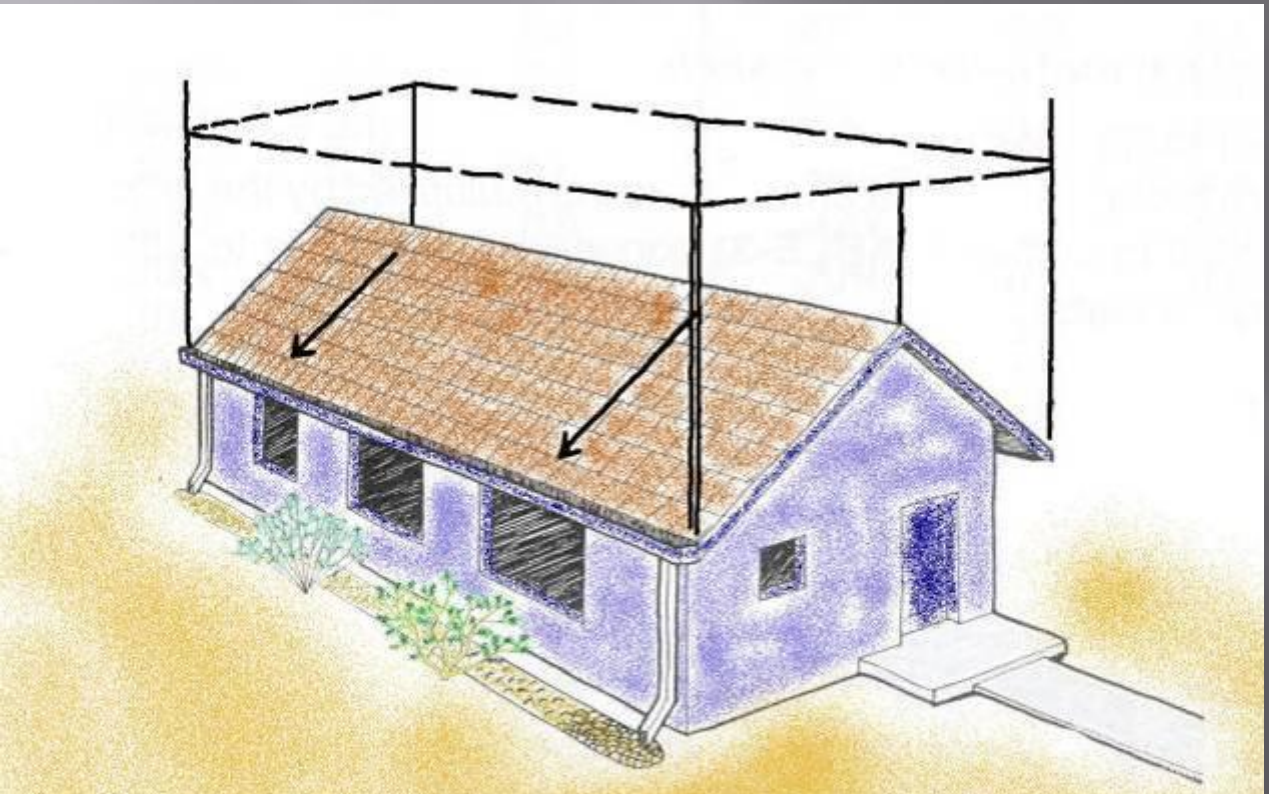
- SQ. FT. X .6 X INCHES OF RAIN PER YEAR = GALLONS OF WATER PER YEAR
- FOR THE UNCE CAMPUS THERE IS ABOUT 148,000 (+) SQUARE FEET OF HARD-SCAPE AND ROOFS

  148,000 X .6 = 88,800 Gallons

  88,800 X 4 INCHES OF RAIN = 355,200 GALLONS OF WATER WE COULD HARVEST EACH YEAR

FROM HARVESTING RAINWATER FOR LANDSCAPE USE UNIVERSITY OF AZ.

DETERMINE HOW MUCH WATER YOU CAN HARVEST FROM YOUR ROOF



AREA OF SLOPED ROOF LENGTH X WIDTH

ANNUAL SUPPLY FROM ROOF CATCHMENT	
Inches/ Rainfall	Gallons/Square Foot
0	.0
1	.6
2	1.3
3	1.9
4	2.5
5	3.1
6	3.7
7	4.4
8	5.0
9	5.6
10	6.2
11	6.8
12	7.5
13	8.1
14	8.7
15	9.3

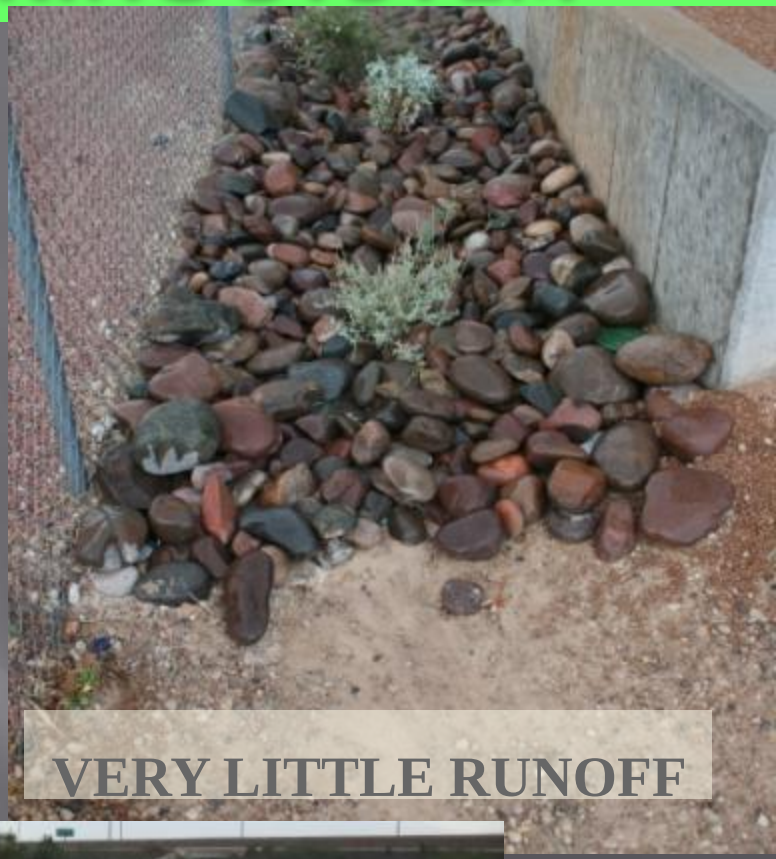
FROM HARVESTING RAINWATER FOR LANDSCAPE USE UNIVERSITY OF ARIZONA

RETENTION AREAS RECYCLE RUNOFF FROM RAIN

EXAMPLES OF A WORKING SYSTEM

EXAMPLES OF A WORKING SYSTEM

EXAMPLES OF A WORKING SYSTEM



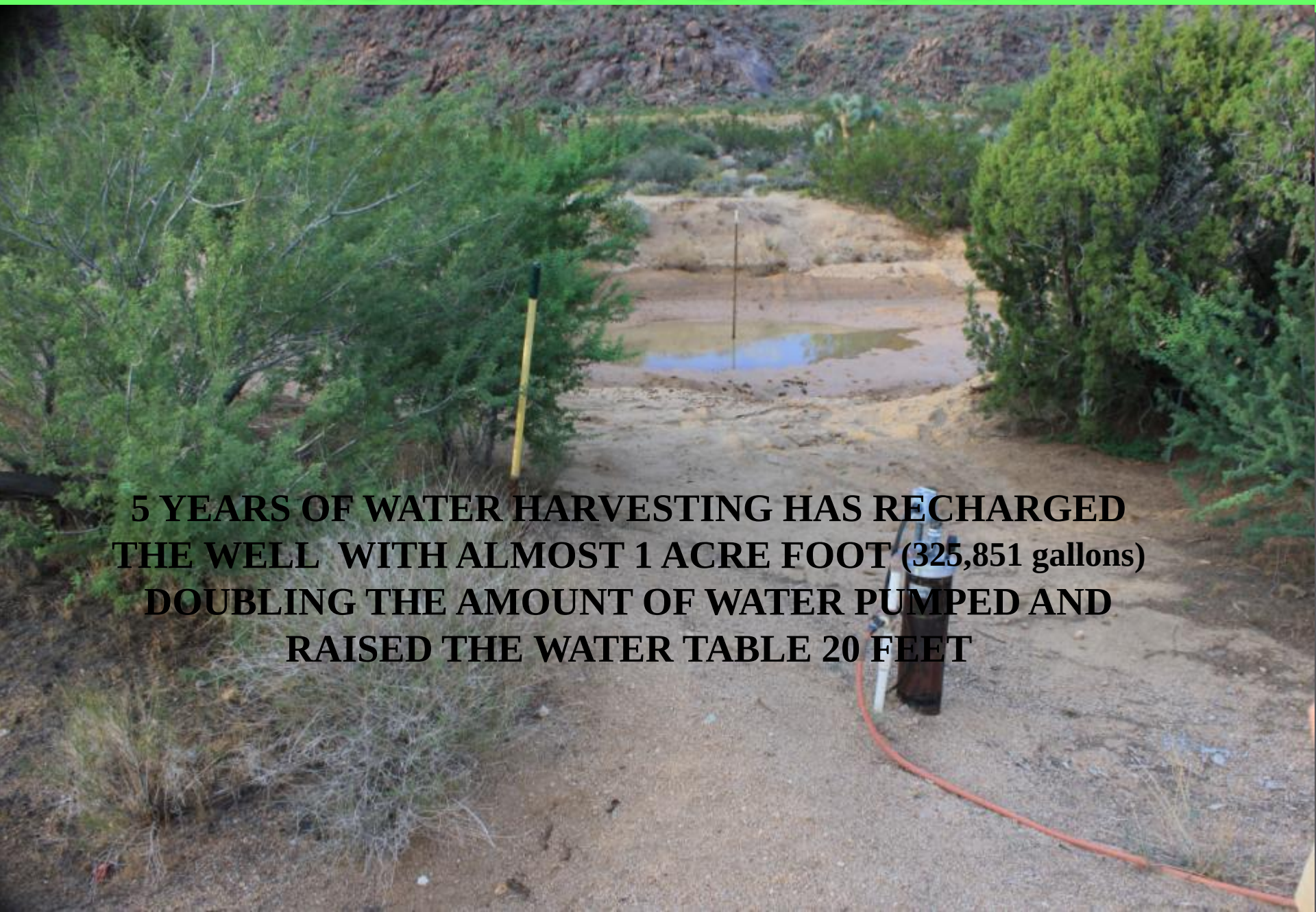
VERY LITTLE RUNOFF

A LARGE AMOUNT OF RUNOFF FROM PARKING LOT

THE UNCE NEW WASH WORKING SYSTEM

WORKING WASH SYSTEM

WORKING WASH SYSTEM




75 000 GALLONS OF RAIN
WATER HARVEST

RAIN WATER HARVESTING IN DESERT GARDENS

HIGHWAY WATER HARVEST

HIGHWAY WATER HARVEST

HENDERSON NEVADA

WATER HARVEST

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EXAMPLE OF A POOR DRY WASH

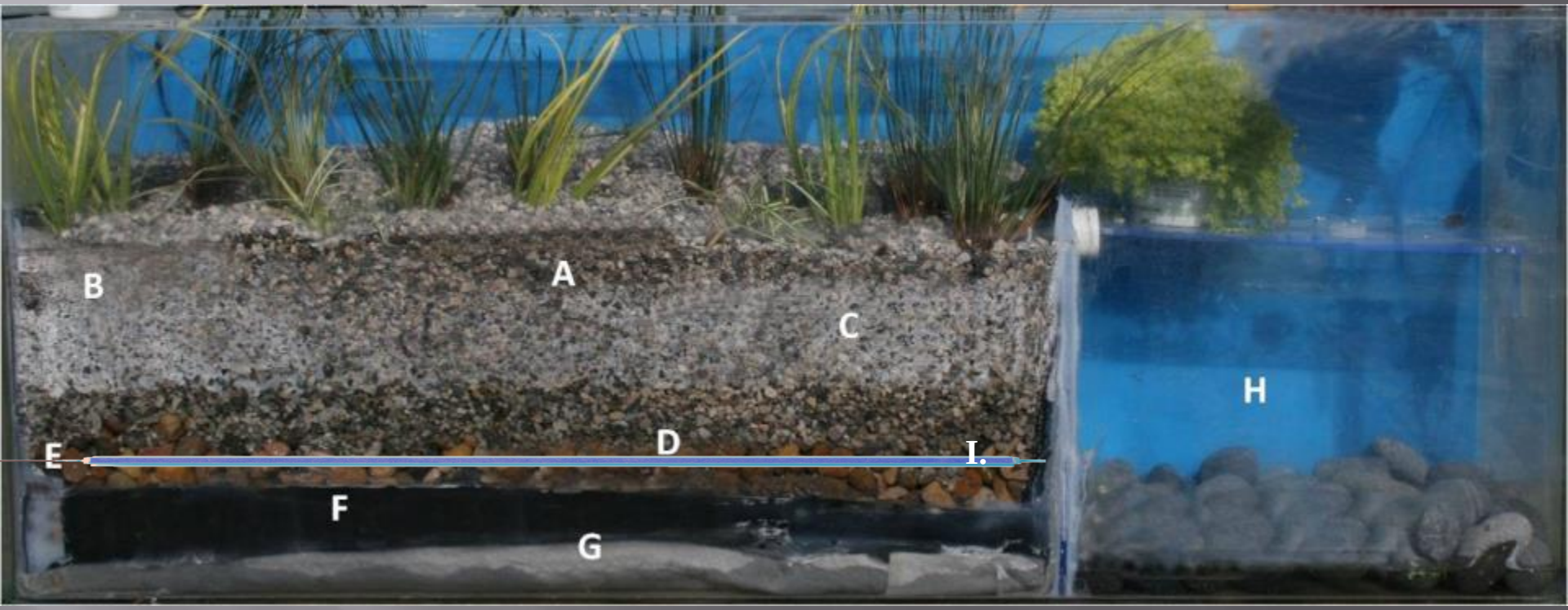
THIS WASH WAS DESIGNED FOR SHOW

WHEN THE IRRIGATION LINE BROKE IT COULD NOT CATCH AND HOLD THE RUN OFF

CONSTRUCTED WETLANDS

RECYCLE WASTE WATER

INSIDE A CONSTRUCTED WETLANDS



A Water should always be subsurface
B. Plant roots filter the water
C. 1/4 inch pea gravel makes up 2/3 of the filter bed
D. 3/4 to 2 inch rock forms 1/3 of the filter bed
E. Water is pumped to the bottom
.

F. Impermeable liner
G. Under liner
H. Water storage
I. AERATION TUB

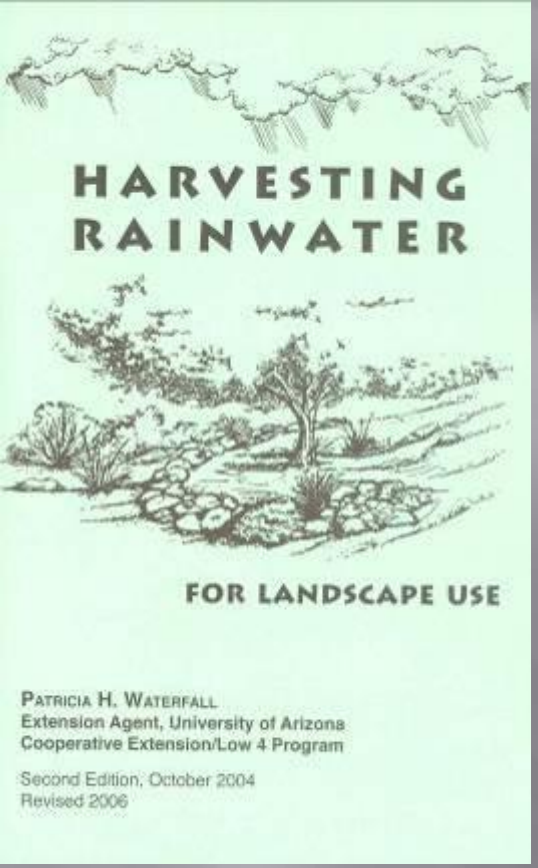
THE SPRINGS PRESERVE CONSTRUCTED WETLAND

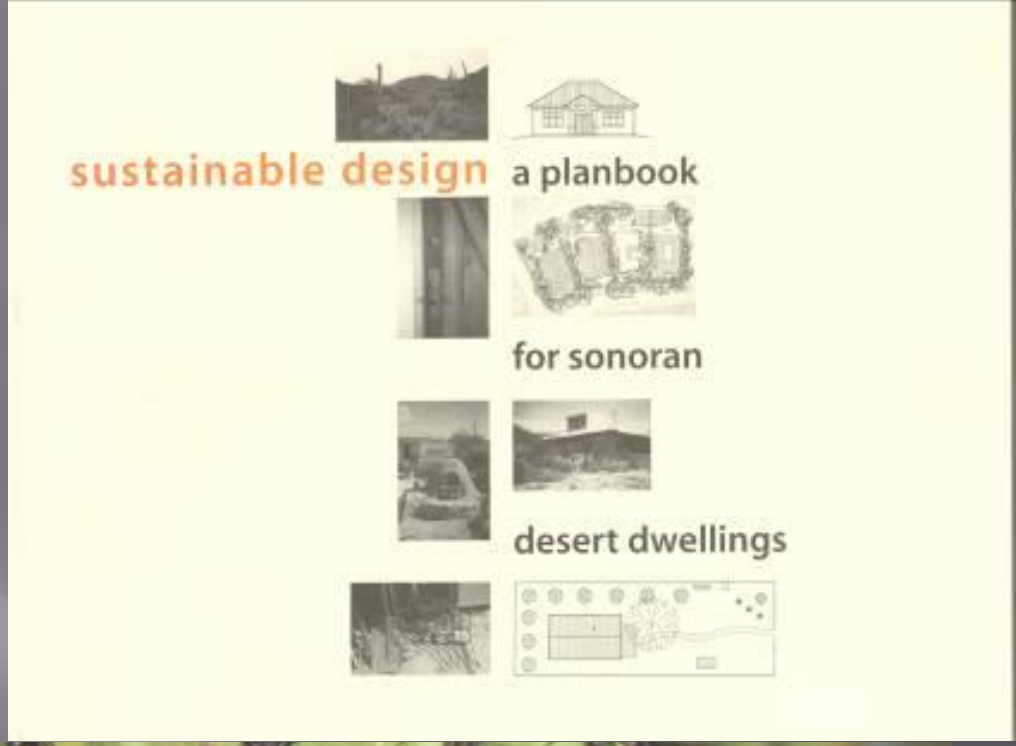
WATER HARVEST GRAY WATER

CHECK LOCAL LAWS REGULATING GRAY WATER FIRST

WATER HARVEST GRAY WATER

CHECK LOCAL LAWS REGULATING GRAY WATER FIRST





WATER HARVEST MORE INFORMATION

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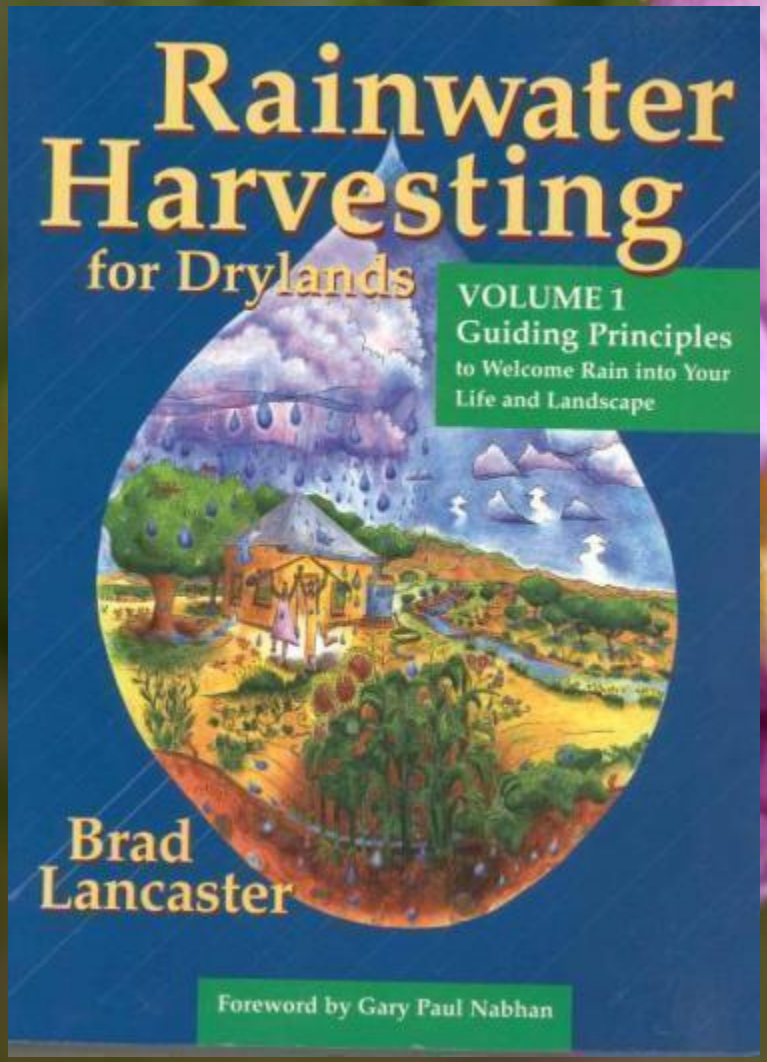
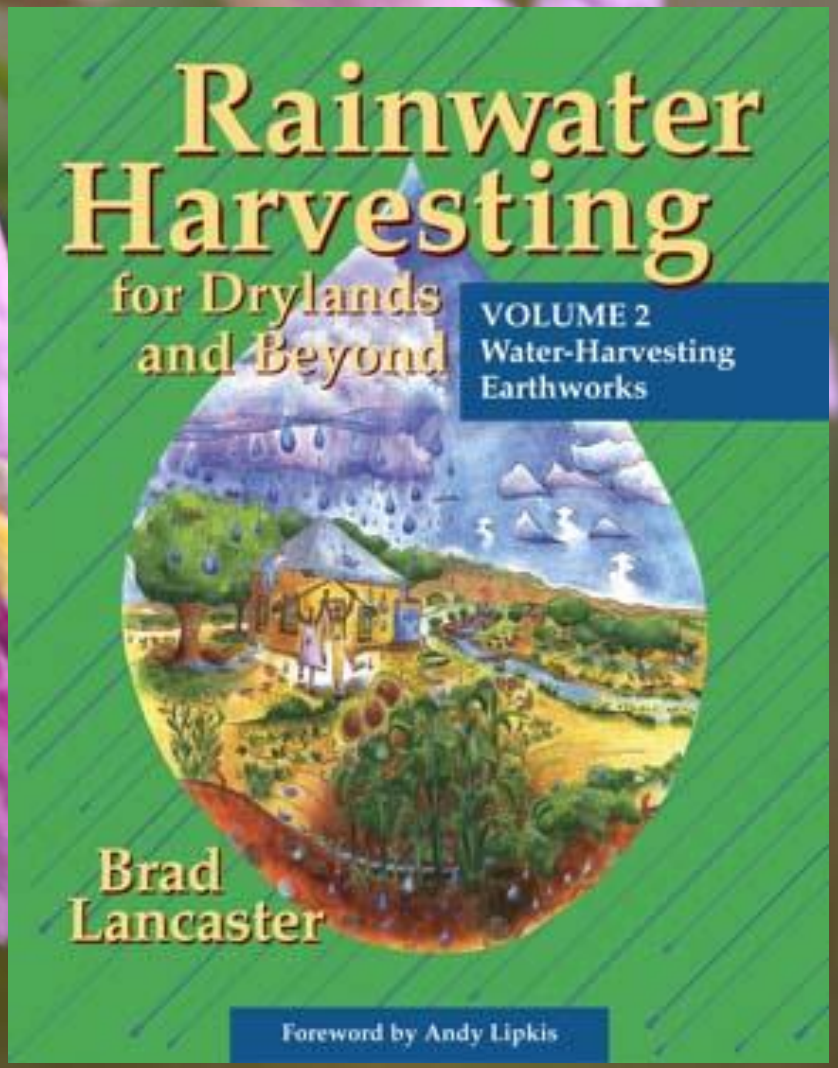
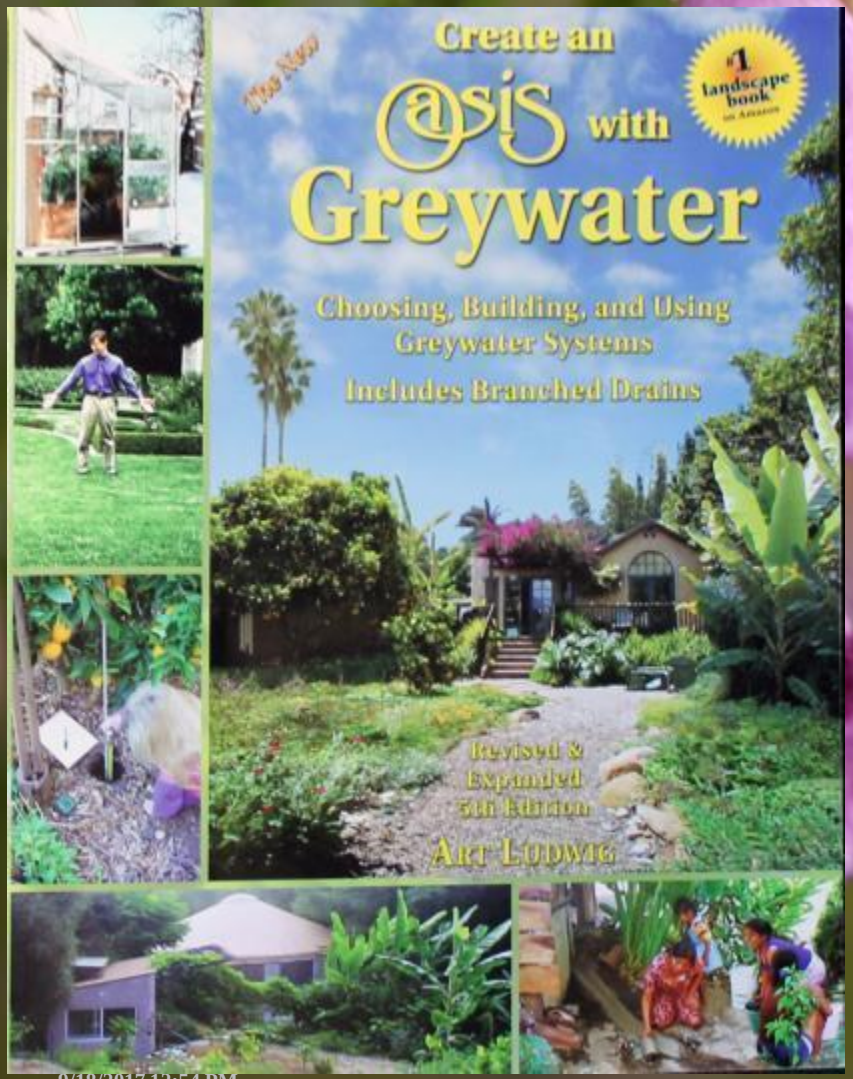
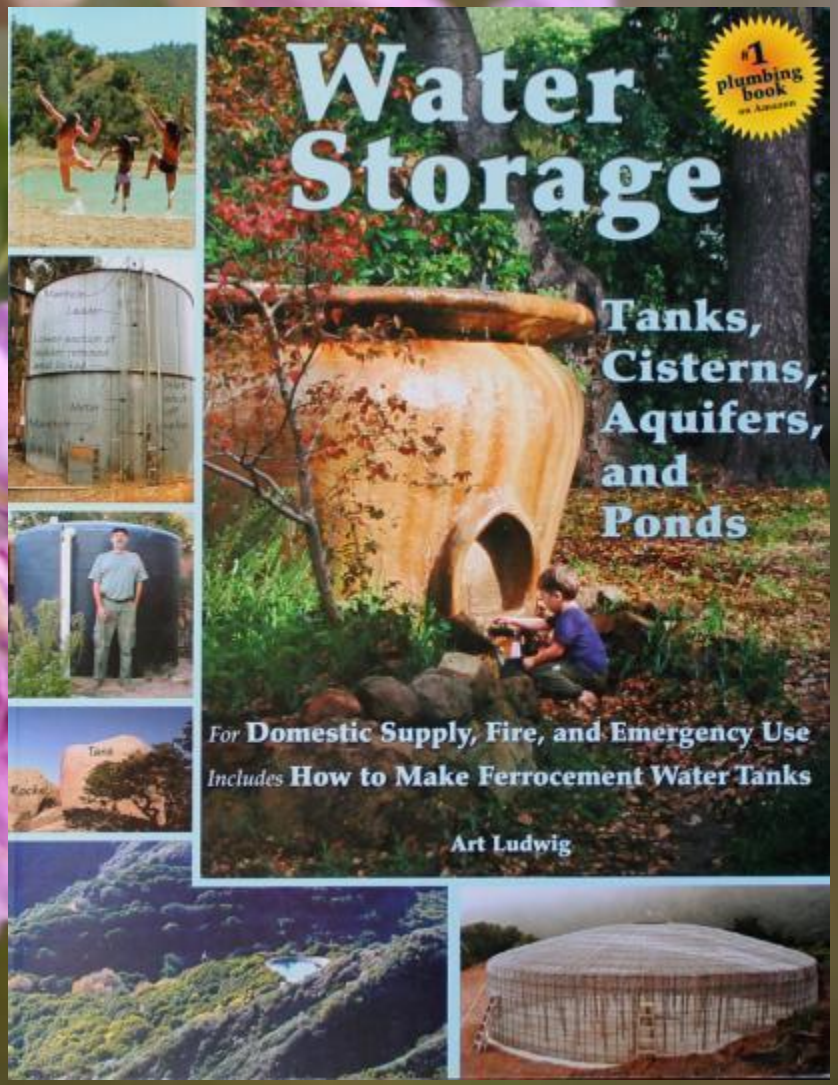
MORE INFORMATION





WATER HARVEST
MORE INFORMATION






WATER DIRECTLY
INTO THE STREEN

DESIGN PRINCIPLES OF DESERT BIOSCAPE

- KNOW THE CLIMATE AND MICROCLIMATES OF YOUR landscape
- SELECT PLANTS THAT ARE ADAPTED FOR YOUR AREA (NATIVE AND NATIVE-LIKE), AND GROUP PLANTS WITH SIMILAR NEEDS TOGETHER
- PLANT PROPERLY AND GIVE SUPPLEMENTAL MAINTENANCE UNTIL ESTABLISHED

- CHOOSE PLANTS THAT ATTRACT WILDLIFE BY PROVIDING FOOD AND SHELTER
- SELECT PLANTS THAT WILL SAVE WATER AND ENERGY
- CHOOSE PLANTS THAT WILL STILL BE IN BALANCE IN THE LANSCAPE AFTER 10 TO 15 YEARS
- PLANT FEWER PLANTS SO THEY HAVE ROOM TO GROW

- CHOOSE PERENIALS OR ANNUALS THAT WILL RESEED (FREE PLANTS ARE GOOD)
- SELECT TREES AND PLANTS THAT ARE SELF MULCHING SUCH AS PINE TREES
- WATER HARVEST
- MAINTAIN IRRIGATION SYSTEMS
- PLANT FOR SHADE

- USE DESERT PLANTS IN CONTAINERS
- MAKE SURE YOUR LANDSCAPE IS SUSTANIABLE NOT ON LIFE SUPPORT
- BEFORE BEGINNING TO LANDSCAPE CHECK OUT NATURAL/NATIVE AREAS NEAR YOUR HOME AND SEE WHAT THEY HAVE TO TEACH YOU

SIX GOOD REASONS TO PLANT A GARDEN FOR WILDLIFE

1. CONSERVE WATER AND ENERGY
2. USE FEWER CHEMICAL FERTILIZERS AND PESTICIDES
3. PROVIDE HABITAT FOR ANIMALS THAT BECOME HOMELESS THROUGH DEVELOPMENT

4. ADD DIVERSITY AND RESTORE NATURAL ORDER
5. LESS YARD WORK
6. HAVE A LANDSCAPE WITH YEAR ROUND APPEAL DUE TO SEASONAL CHANGE

THE 7TH REASON DO IT FOR THE FUTURE

ANYONE CAN ZEROSCAPE TO SAVE WATER

ANYONE CAN ZEROSCAPE TO SAVE WATER BUT DO YOU REALLY WANT TOO


YOU CAN PAINT THE ROCKS GREEN


SIMPLE AND COLORFUL

SIMPLE AND EFFICIENT

DESERT BIOSCAPE IS SUSTAINABLE

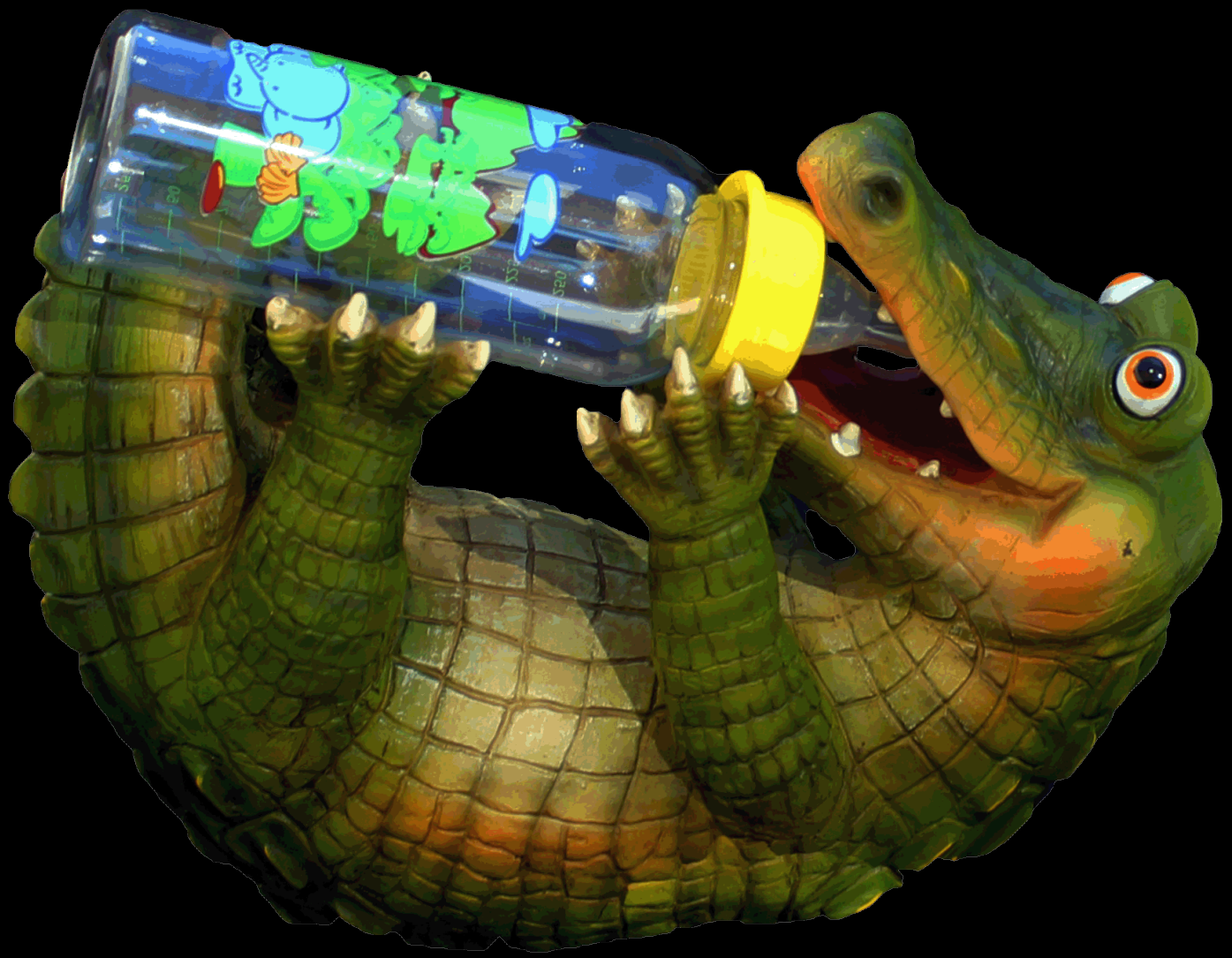
“THE GARDEN IS SAID TO BE AN INDEX OF THE OWNER'S MIND”
(THE GARDENER’S MANUAL PUBLISHED BY THE SHAKERS 1843)

WHAT DOES YOUR GARDEN SAY ABOUT YOU?


REMEMBER THINGS ARE NOT ALWAYS WHAT THEY SEEM


GARDENING
IT'S CHEAPER THAN THERAPY
AND YOU GET TOMATOES

TIME EAT



DESERT BIOSCAPE SUSTAINABLE URBAN HORTICULTURE

OR GETTING OVER DESERT DENIAL

- FOR MORE INFORMATION CONTACT

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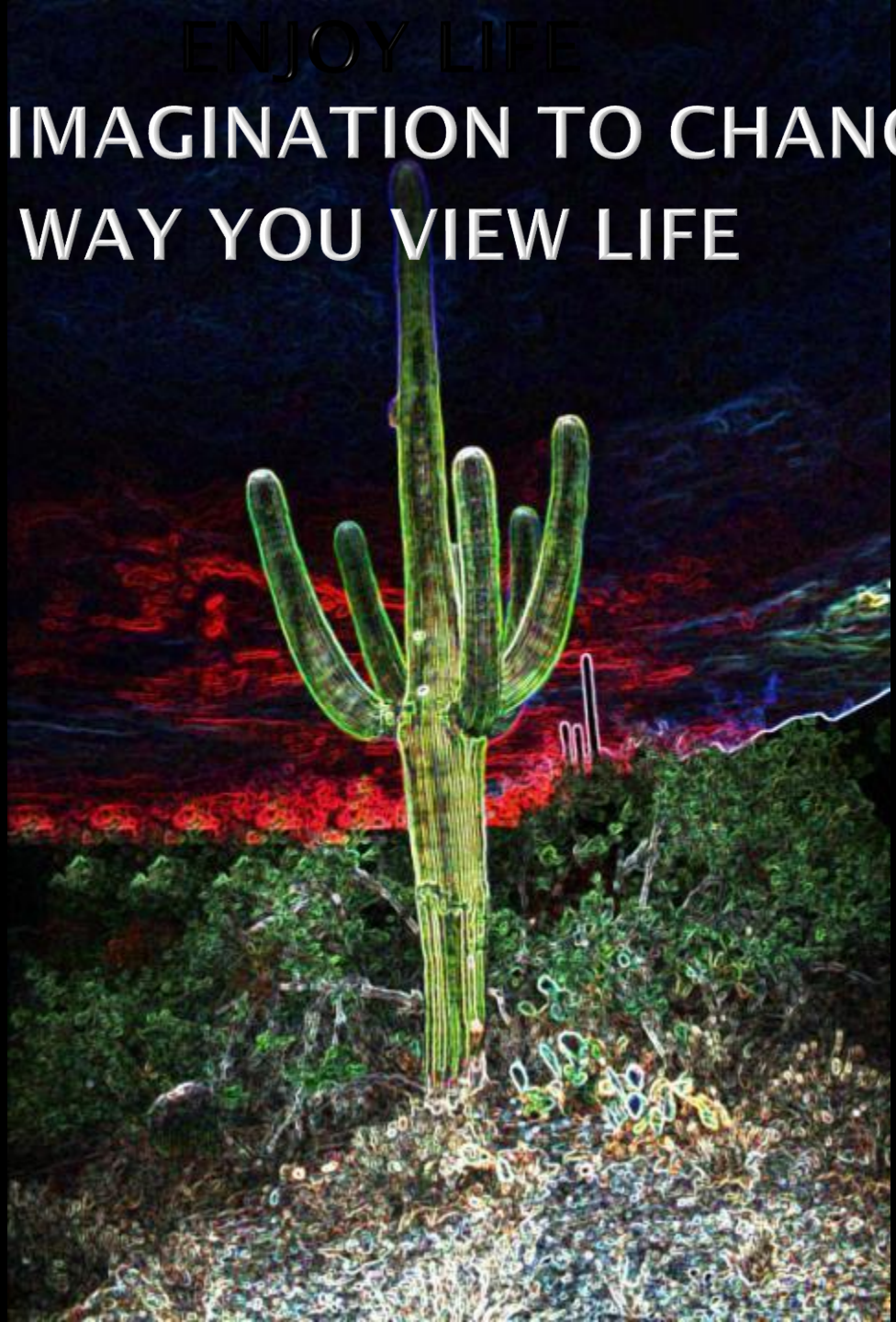
COOPERATIVE EXTENSION
Bringing the University to You

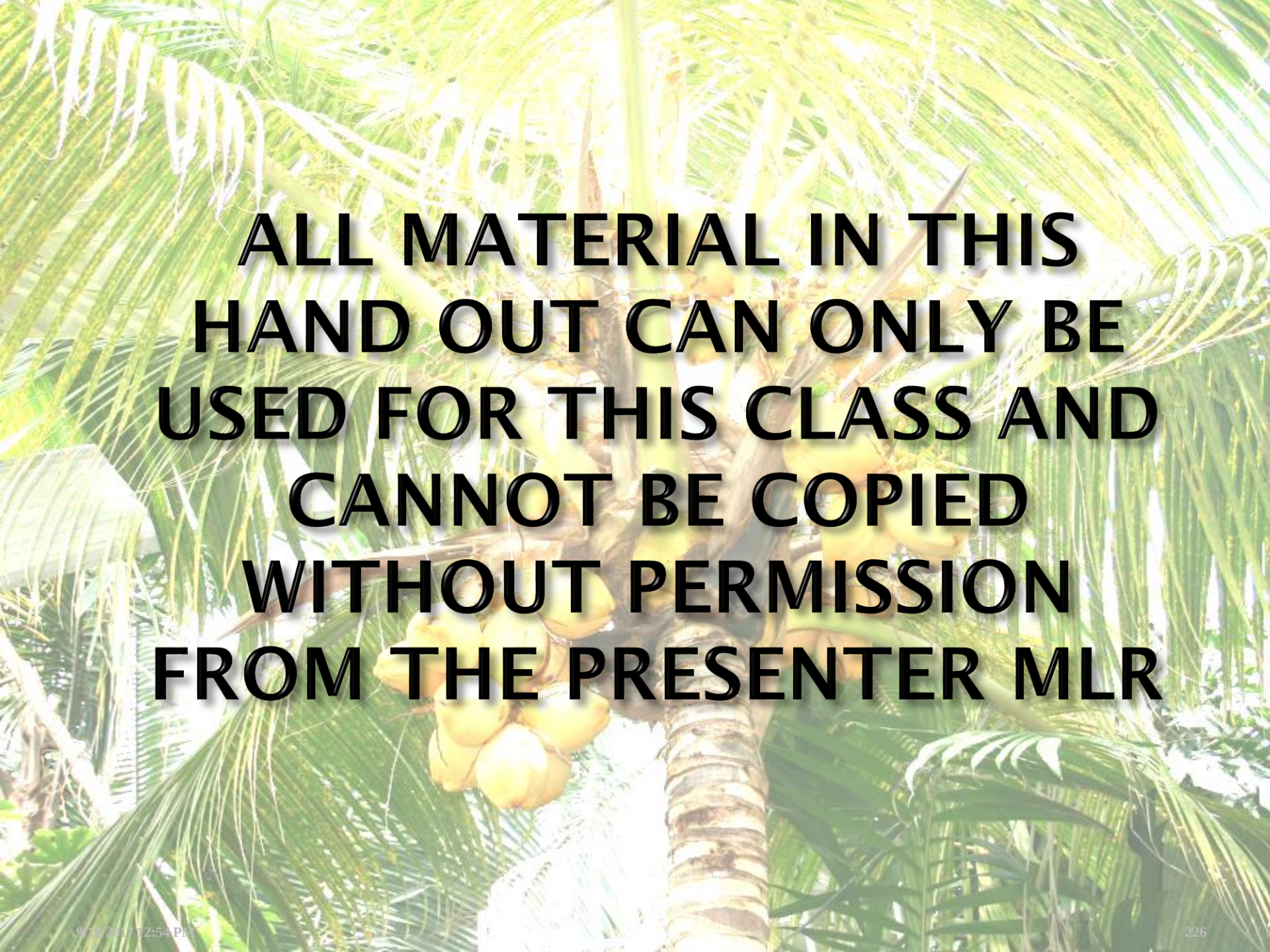
DESERT DENIAL

USE YOUR IMAGINATION TO CHANGE THE WAY YOU VIEW LIFE



TAKE IT EASY

ENJOY LIFE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REFERENCES

HARVESTING RAINWATER FOR LANDSCAPE USE UNIVERSITY OF ARIZONA PATRICIA H. WATERFALL, SECOND EDITION, OCTOBER 2004 REVISED 2006

PHOTOS WATER HARVEST IN CACTUS GARDEN AND WITH ROCKS BY JAN EMMING OF HIS RANCH YUCCA AZ.

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PEPSI


WOMEN


MEN