

# New Mexico Dye Plants

Myra Chang Thompson  
&  
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CASA SAN YSIDRO PRESENTS  
2ND SATURDAY

## NEW MEXICO DYE PLANTS

For centuries, people have culturally used native plant dyes to decorate fabrics, crafts, hair, and more. In New Mexico, Native American and Spanish weavers have used native plants to dye wool with an array of colors to create one of a kind textiles and clothing. A traditional weaver's expertise not only required the skill and dexterity necessary to create intricate designs and patterns but also the knowledge of where to find plants that yielded desired colors.

Join us online June 12th as Rio Grande Return Conservation Director, Cameron Weber and textile artist, Myra Chang Thompson, describe native dye plants, their uses, and the local practices that people have used in New Mexico for generations.

JUNE 12TH @ 1:00 PM  
ZOOM:

[HTTPS://US02WEB.ZOOM.US/J/83285777166](https://us02web.zoom.us/j/83285777166)

# Fiber Identification

- What kinds of fiber were used by the Colonial Spanish and indigenous peoples of New Mexico?
- Churro
  - With the arrival of the Spanish, Churro sheep wool became the foundation for Native, Spanish, and Mexican textiles.
  - The Spanish also brought the horizontal treadle floor loom.
- Cotton
  - By the 13th century, cotton was being grown in northern New Mexico.
  - Indigenous peoples were weaving long before the Spanish colonists arrived.
  - Eventually, cotton weaving on the vertical loom largely ceased among Native people by the end of the 19th century.



- Basic Tools and Supplies



YUCCA PLANT  
AND YUCCA ROOT



- The Importance of Fiber

- Sourcing



# Basic Tools and Supplies

- At least 2 pots with lids, able to hold at least 3 to 4 gallons of liquid. One pot should be designated the mordant pot. Stainless steel or glass is best but enameled or aluminum pots will also work.
- 3 or 4 smaller saucepans with lids. Stainless steel and/or glass are preferred
- Several plastic bowls or buckets some with lids for soaking dyestuffs and fibers, for rinsing and storing liquids. A large lidded bucket for dyes that don't require heating. Large glass jars and plastic containers with lids for storing liquids
- Stainless steel tongs, long handled spoons, plastic or wooden rods for stirring and to remove goods from the dye pot.
- Heatproof glass measuring cup with metric measurements.
- A set of measuring spoons.
- Digital weighting scales which can be calibrated in grams.
- A fine mesh strainer for straining off fine dyestuffs.
- Muslin, cheesecloth or coffee filter paper to strain off very fine dyes in powder form.
- A large plastic strainer or colander for straining off other dyestuff that will allow your hands to be free.
- A digital thermometer is helpful in determining the temperature of the liquids.
  - Rubber gloves.
  - Oven gloves or hot pads
  - Dust mask
- A heat source that can easily change temperatures.
- Water source
- PH papers to check pH values of water and dye baths.
- Cleaning materials
  - Waterproof labels and marking pen for identifying mordants
  - Cotton or linen yarn or cloth strips to use for skein ties. Not wool as they may disintegrate in hot alkaline solutions.

# Scouring

**Scouring** – Scouring is to clean fibers prior to mordanting and dyeing. It does not refer to “machine washing.”

To scour **wool** follow the following instructions:

- Use a pH neutral detergent such as Eucalan, unscented laundry detergent (Tide, Orvus paste) to scour fiber or fabric. Wet the materials thoroughly using tap water.
- Amount of detergent is determined by:
  - for raw wool use 1 to 3 % of the Weight of the Goods (WOG fiber, yarn or fabric)
  - for commercially prepared wool use 0.5 to 1% (up to 1 gm detergent for 100 gm of fiber, yarn or .) exceptionally greasy/dirty use up to 5% of WOG
- Mix detergent with 1 c. boiling hot water. Add to a large pot of room temperature water. Place the pot on a heat source. Still well to dissolve detergent. Add fiber.
- Slowly raise the temperature to 180 degrees F. Rotate the fiber gently to avoid felting. Hold at 180 degrees for 30 minutes.
- Remove fiber and rinse in hot water to avoid a temperature shift. Rinse twice if scouring water is dark or dirty repeat the scouring bath.
- Gently squeeze excess water out using rubber gloves—it’s hot! Proceed to mordanting.

To scour **cellulose (plant) fibers** follow the following instructions:

- Calculate amount of scour needed. 1 to 2 % of Weight of Goods or ¼ to ½ teaspoon Soda Ash for 100 grams or 4 ounces of fiber. For dirty, unbleached or greasy fiber use 2% of WOG.
- Wet out Soda Ash in a little cold water and add to a small amount of hot water to dissolve.
- Fill a large pot with room temperature water so that the fiber can move around easily. Place on a heat source and add Soda Ash mixture. Stir until dissolved.
- Slowly bring the pot to 180 degrees F and hold for 30 minutes.
- Carefully remove fibers from the HOT pot. Rinse in cool water, squeeze out excess water.
- Proceed to mordanting. IF fibers are still dirty, repeat the scouring process.



- Bundles of wool being scoured.



# Mordant

- Mordant for cellulose (cotton)
- Mordant for wool

MORDANT  
ASHES OF JUNPER  
(JUNIPERUS  
MONOSPERMA)



Bare - Mordanted cotton, wool, and wool roving awaiting dyes



# Mordanting for cellulose (plant) fibers

- **Mordanting** is important in getting fibers ready to accept color.
- Mordants ensure that your fiber will have more durable and longer lasting color.
- Recommended mordant is Aluminum Acetate in a range of 5 to 18% WOG (weight of goods)
- Wheat bran is recommended to neutralize the goods in 5% of WOG (or 1 rounded teaspoon per 4 oz/100 gm.
  - Encase in cheesecloth or a nylon stocking and secure.
- **To mordant cellulose fibers use a mask when mixing aluminum acetate:**
  - Wet out aluminum acetate in a small amount of cool water. Dissolve this in boiling hot water in a small pot or vessel.
  - Fill a dye pot with HOT tap water.
  - Add the aluminum acetate mixture to the pot and stir to dissolve. Place on heat source.
  - Add fiber to pot and press out air bubbles (if using cold tap water heat to 110 degrees)
  - Rotate fiber occasionally and hold at temperature for 45 minutes.
  - Remove fiber from pot. Squeeze out excess water. Do not rinse.
  - Place wheat bran in a cheesecloth or nylon stocking, secure. Soak bran in a container with HOT water.
    - The mixture will be milky looking, Solution lasts for 1 to 3 days.
  - Fill a bucket or pot with HOT tap water. Add the bran bundle and bran solution.
    - Squeeze the bundle to extract more bran.
  - Place mordanted fiber in bran solution for 30 minutes. Stir occasionally.
  - Remove from bran solution and squeeze out excess solution.
  - Do not rinse! Fibers are ready to dye.



- Cotton fabric with bran in the rinse to neutralize the cloth.



# Mordanting Wool and Animal Fibers Using Aluminum Sulfate and Cream of Tartar

- **Mordanting** is important in getting fibers ready to accept color. Mordants ensure that your fiber will have more durable and longer lasting color. Cream of tartar helps the alum to bond with the wool and keeps the wool fibers soft.
- Aluminum Sulfate will be use at 12% to 20% WOG or 1 ¼ teaspoon per 100 gm/4 oz. 1 Tablespoon per 100 gm/4 oz. Deepens shades especially reds. When used together, the chemicals brighten many colors. Cream of tartar will be used at 6% WOG or 1 ¼ teaspoons per 100gr/4 oz.
- Wear a dust mask, gloves and apron as Aluminum Sulfate is considered non-toxic but may irritate nose, throat or skin.
- Pour Aluminum Sulfate into a container, add 1 cup of hot water. Stir until dissolved. Dissolve Cream of Tartar separate in the same fashion.
- Fill dye pot with tap water at room temperature and place on a heat source.
- Add dissolved Aluminum Sulfate and Cream of Tartar. Stir well.
- Add fiber to pot. Rotate gently and press out air bubbles. Slowly bring the temperature up to 180 degrees and hold for 45 minutes. Stir occasionally.
- Allow to cool briefly and remove from pot. (you may leave overnight to cool.) Remove excess moisture. Proceed to dyeing.

NOTE: Mordant can be reused two times. After that, you can add 25% Aluminum Sulfate and 1 teaspoon/100 gm of Cream of tartar to recharge the mordant bath.

Discard the mordant when it becomes cloudy or when large flakes appear.

Mordanted fibers (both cellulose and protein) may be stored for 3 to 5 days in a sealed plastic bag. This may result in deeper color results but it is also apt to mold.

Air dry mordanted fibers, (both cellulose and protein), label and store for future use.

Mordanted protein fibers hold their mordant for 5+ years.



# Dyes

- Differences and Variations



5 Colors

Dyed colors top right indigo, walnut, madder, hollyhock, cottonwood catkins, chamisa



- Black hollyhocks previous to extraction.



- Hollyhock as appeared in dyebath.





- Hollyhock after simmering, color change.





# Creating a Dye Bath

## Creating a Dye bath from Flowers (fresh or dried) or dyestuff

This applies to Cota, cottonwood catkins, chamisa, holly hocks, madder roots, walnut husks, and pomegranate skins as well.

**Amounts:** for fresh flowers: 100% weight of goods (WOG) for dried flowers 20 to 100% WOG. More dye material will result in darker colors.

- Weigh the dye plants as a percentage of the dry weight of the items to be dyed.
- Put flowers or plant material in a pot with tap water to cover. Place on a burner. Slowly bring to 160 degrees F and hold for 30 to 45 minutes.
- Strain dyestuff with a strainer. Reserve dye and dyestuff.
- Repeat the cooking process to get as much color from the dyestuff. The extraction is complete when the dyestuff stop giving off color. Combine all extracted baths.
- The extracted dyestuff may be dried to use for eco dyeing or composted
- Place a clean dye pot on a heat source. Add all of the dye bath and any additional water needed for the fiber to move easily in the pot. Add fiber or fabric
- Bring the dye bath gradually to 160 degrees F for 30 to 45 minutes. Do not boil.
- Cool in the dye bath overnight for a deeper shade of color.
- Remove fiber/fabric from dye bath. Rinse one or two times and air dry away from direct light. Wash gently in a neutral liquid soap and dry away from direct light.



hollyhock as appeared in dyebath

# The Dye Process



Freshly picked cottonwood catkins harvested in the Rio Grande Bosque in Los Lunas. This is approximately 1 pound and 13 ounces. Add water and crush to release plant juices.

#1



Cottonwood catkins after simmering for an hour.  
The dye bath is in the enamel pot below the strainer.

#2





Cottonwood catkin dye bath with aluminum sulfate mordant added. Three batches of dyeing handspun wool yarn were cooked.

#3



Yarn in dye bath for 45 minutes at a simmer. Yarn will be rinsed, dried and then washed with a mild Soap.

#4



Three successive dyes for increasingly longer periods of time in the same dye bath. The skein on the far right was dyed first, the middle skein was dyed second and the far left skein was dyed last. The dye bath created a range of colors as the dye bath exhausted. #5



# Demonstrations:

**Chamisa**



**Cochineal**



**Indigo**



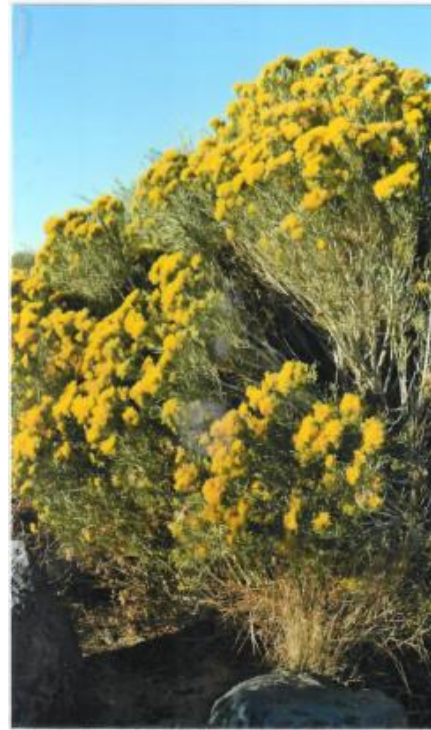
**Pomegranate**





# Chamisa

- Chamisa thrives in a wide range of coarse alkaline soils - common to desert environments.
- Flowers and stems used traditionally by the Navajo and Zuñi as a dye source.
- Yellow dyes are produced from the flower clusters and twigs in wool mordanted with alum.
- The stems are also used to make baskets.



## Shades of Chamisa

Heavy rug wool and fine knitting wool (local Cormo), background historic replica of Jerga woven in Churro wool with chamisa dyed yellow.



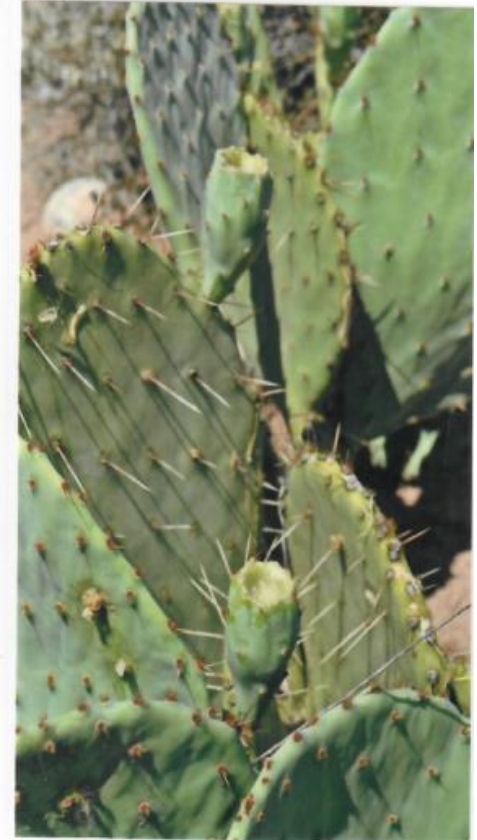


# Cochineal

- A scale insect from which a natural dye is derived.
- A sessile parasite native to tropical and subtropical South America through North America.
- The insects are found on the pads of prickly pear cacti, collected by brushing them off the plants, and dried.
- The dye was used in North America during the 15th century for coloring fabrics and became an important / export good during the colonial period.



COCHENIEL  
CACTUS LOUSE



PRICKLEY PEAR  
CACTUS



Bí ní ghá dzí ít ó ní / Poncho style  
Navajo Serape

Artist: [Navajo Nation](#)

Date: ca. 1850

Medium: Wool (animal fiber), indigo,

raveled wool yarn, cochineal or lac

Credit Line: Albuquerque Museum,

gift of Dr. Bainbridge Bunting

Object number: PC1974.111.1



# Indigo

- Indigo blue was used for a majority of early Spanish blankets – possibly because the imported indigo was readily available and cost less than other imported dye materials.
- The Spanish indigo-dyed blankets were highly prized and given very hard use.
- Indigo, used as one of the main colors generally indicates a blanket of high quality, not only in materials (mainly the wool), but also in design.
- After examining hundreds of these blankets it becomes evident that initially there must have been a design source for the entire group – a set of instructions or drawings to follow, or a blanket to copy or use as a point of reference in weaving them.

- Nora Fisher

Rio Grande Textiles 1979



Rio Grande Blanket, ca. 1850  
Warp: 2 ply handspun wool;  
weft: 1 ply handspun wool, light  
and dark undyed natural and  
indigo.  
Collections of the School of  
American Research in the  
Museum of New Mexico



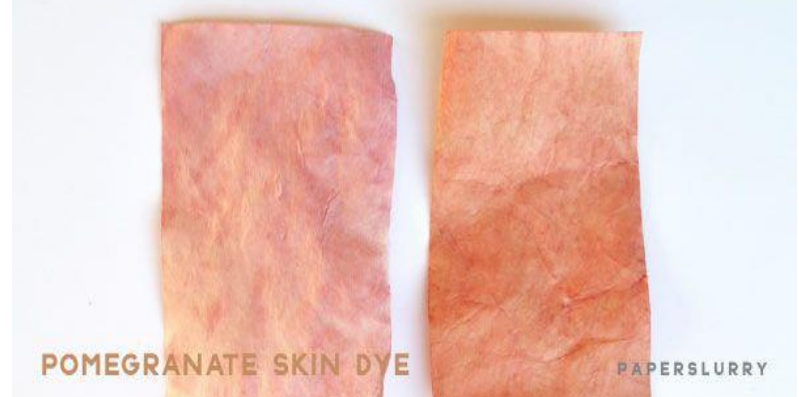
Shades of Indigo all samples are dyed with indigo background Shibori dyed rayon cloth, right top silk, mercerized cotton, next left, Churro wool top left linen single and wool single. The depth of color varies due to strength of dye, length of time it is submerged and the type of fiber.





# Pomegranate

- Pomegranate is one of the oldest fruits in cultivation and its rind has been used as a dye by carpet makers for millennia.
- 'Pomegranate' means seeded apple in Latin. The city of Granada in Spain was named after the pomegranate fruit.
- The dye is high in tannin, and therefore works particularly well with cotton and other plant fibers. It can also be used to dye wool and silk.





# Walnut

- Walnut dyed wool yarn (left)
- Spun wool yarn of the roving (on the far right) dyed with walnut, cochineal, madder and safflower.





# Cota

- Wool yarn dyed with Cota full strength dye.
- Wool yarn dyed with Cota in the second dye bath.
- Cotton fabric dyed with Cota full strength dye and
- samples of dried cota dyestuff.





# Madder

- Wool yarn dyed with full strength madder dye.
- Second skein wool yarn dyed with the leftover dye.
- Cotton fabric dyed with full strength madder dye.





# Is there Enough?

A population must have enough strong individuals successfully reproducing seed to survive the export of seed by wildcrafters.

To gauge this, count the plants with seed. Try to limit collections to populations of 50+ within view at once.

Never collect if there are 10 or fewer plants with viable seed. Certainly do not collect seed from rare or endangered plants.



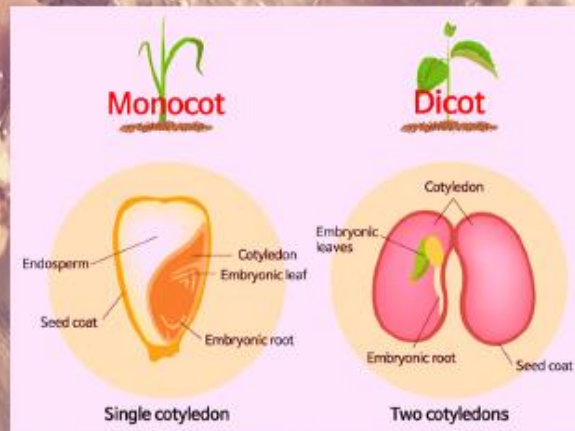
- ~ 50 individual plants within view with viable seedset
- Seedset is abundant
- Population has both young and old individuals
- Species is known

# Is it Ripe & Mature?

Take a small sample of seed in hand from one plant and examine it closely. Notice the variation in maturity in your sample - is most seed fully mature? Collection should occur only at that point. If you collect too early, much seed will be wasted - not useful to you and not able to complete its lifecycle.

Ripe seed has a hard seed coat and most species will resist being smashed if you try to cut into the seed with your thumbnail.

Seed maturity is about whether complete fertilization occurred and the embryo is developed and protected by the seed coat. Immature seed is often milky. Mature seed is brittle and hard. Use a jeweler's loupe or magnifying glass to inspect seed over a light and you will find each mature seed has a dense core where the embryonic root and life potential reside.



# How Much Do I Need?

Take only as much seed from the ecosystem as is both necessary and fair. Certainly take no more than 25% of the ripe, mature seed available on a given day.

Consider that native seeds generally have high rates of germination. Estimate the number of seeds you need for your planting project. If the sample you examined was mostly fully mature, how many samples from how many individual plants would you need to meet your collection need? Count out loud to that number as you collect to keep track.

Give thanks!

Label each collection bag:

- Species/plant name
- Date of collection
- Location of collection
- Target collection size

## Seed storage

Clean and labeled seed can be stored if protected from heat, light, moisture/humidity, and insects. A sturdy envelope in a plastic tub with silica packets works very well. Do not store in air-tight containers because seeds are alive and need air!



# Tools

- Paper grocery bags
- Field guide to local plants with described rare & endangered
- Nitrile gloves
- Pruning shears
- Loupe or magnifying glass
- Permanent marker
- Razor blade to cut seed open for inspection of maturity
- Silica packets
- Kitchen sieves to clean off chaff

Cameron Weber tends to the healing of Earth's critical land and water through restoration, gardening, and educational events.

Reach out at [cameron.weber@gmail.com](mailto:cameron.weber@gmail.com)

# Wild Seed Collection

## A Guide to Ethical and Viable Wildcrafting

Wild seed is a critical part of the local ecosystem. Collecting seed can either participate in the ecosystem or deplete it. Choose participation as a wildcrafter by asking permission from the place, and by taking only what you can steward.


Don't collect from the first plant you see, but walk among the population and notice which plants have abundant seed. Return the seed you collect to the soil - seed can only take root out of your hands.


**"With every deed you are sowing a seed, though the harvest you may not see."**

—Ella Wheeler Wilcox


Note the soil texture and local ecology to better meet these needs come


# Planting Time

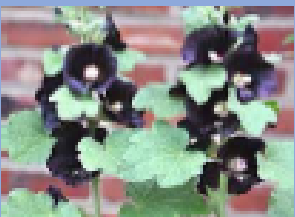
Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
	 <p data-bbox="175 782 316 811"><b>Cochineal</b></p>	<p data-bbox="494 691 937 805">Utterly dependent on healthy prickly pear populations of the Sonoran and Chihuahuan Deserts.</p>	<p data-bbox="944 733 1155 805">April in the Sonoran Desert.</p>	<p data-bbox="1186 605 1541 805">The cochineal are individually knocked, brushed, or picked from the cacti, then carefully dried and stored until use. Whole bodies are ground to a fine powder.</p>	<p data-bbox="1561 691 1891 805">The female cochineal bodies are collected and dried from prickly pear cactus.</p>

Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
	 <p data-bbox="185 796 305 825"><b>Chamisa</b></p>	<p data-bbox="492 576 911 822">Salt shrublands on well-drained, coarse, gravels to clayey and alkaline soils on historic floodplains and terraces, roadways, drainages. Associated species include four-wing saltbush, pinon, grama and bluestem grasses.</p>	<p data-bbox="938 668 1136 822">Flowers in late summer; Bark and twigs in summer or fall.</p>	<p data-bbox="1180 711 1532 822">Flower heads can be cut singly or trace the stem to the base and prune to get both stem and flower.</p>	<p data-bbox="1551 668 1864 822">A long-lived shrub that should be only pruned, not removed entire. Seedheads valuable winter bird forage.</p>






Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
Cota		Sandy soils in arroyo bottoms, ditch edges, and washes. Full sun.	August or September.	Cut the plant with scissors about 4' above the ground, allowing it to resprout from the crown.	If harvested annually, the population will die. Important plant for pollinators and long history as human medicine.

Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
<p data-bbox="117 843 401 875"><b>Cottonwood Catkins</b></p>		<p data-bbox="511 848 956 873">Older, healthy cottonwood trees in bosque.</p>	<p data-bbox="967 753 1201 873">Varies, March to May. Hard to miss once they are there.</p>	<p data-bbox="1213 753 1580 873">Collect the fallen catkins or reach into the low branches of male trees when catkins are deep marroon.</p>	<p data-bbox="1591 848 1688 873">Plentiful.</p>

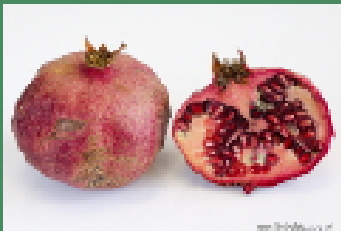
Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
<p data-bbox="131 782 369 811"><b>Hollyhock Petals</b></p>		<p data-bbox="504 782 927 811">Fresh blossoms from established plants.</p>	<p data-bbox="960 782 1058 811">Summer.</p>	<p data-bbox="1207 782 1412 811">Use the petals only.</p>	<p data-bbox="1588 696 1895 811">Garden plant that requires at least two years to begin to bloom. Ask first!</p>




Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
 <p data-bbox="202 782 297 811"><b>Indigo</b></p>		<p data-bbox="504 692 929 763">Annual plants of two species <i>Indigofera</i> that can be grown here with special care.</p> <p data-bbox="504 782 894 811">They are native to tropical conditions.</p>	<p data-bbox="960 782 1108 811">Late summer.</p>	<p data-bbox="1207 692 1570 811">Leaves are harvested late summer when the plant is as large as possible.</p>	<p data-bbox="1588 739 1932 811">Must be cultivated in a garden or container.</p>

Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
	 <p data-bbox="150 782 338 811"><b>Madder Root</b></p>	<p data-bbox="498 735 956 806">Perennial plants grown for the root native to Eurasia. Contains the pigment alizarin.</p>	<p data-bbox="956 692 1203 806">Needs at least two years for harvest of mature root.</p>	<p data-bbox="1203 642 1586 806">Trellis the plants and keep mulch over them in winter. Harvest the mature root during the second autumn.</p>	<p data-bbox="1586 599 1932 806">Must be cultivated in a container. If not grown in a container, will migrate into adjacent areas and will be difficult to control/find.</p>



Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
<p><b>Pomegranate Peels</b></p>		<p>Much-loved, drought tolerant shrub. Grown in gardens.</p>	<p>Fruit are ripe in late summer.</p>	<p>Enjoy the seeds and keep the peels for dye. Store in a glass jar until use.</p>	<p>Grown in gardens and landscapes, or buy them whole at a grocery.</p>

Plant	Image	Home & Neighbors	Season of Harvest	How to Harvest	Ethical Aspects
	 <p data-bbox="152 782 341 811">Walnut Hulls</p>	<p data-bbox="500 691 915 805">Black walnut trees grow mostly in maintained landscapes but occasionally occur in bosque.</p>	<p data-bbox="956 644 1180 805">Mature nuts are ripe in late fall and will drop over the course of winter.</p>	<p data-bbox="1205 644 1537 805">Collect the fallen nuts from the ground as soon as they fall and store in a jar until use. Only the hulls are used; eat the nutmeat.</p>	<p data-bbox="1586 691 1895 805">Important food for birds and wildlife so take only what you need.</p>