CHEMISTRY

Dyes from Your Garden Plants

Onions, beets and flowers yield rich, warm colors. Many of these will not dye the same as the colors of the flowers. Mordants make variety of shades.

By MARTHA G. MORROW

➤ THE GREEN stain of grass across your shirt or the red juice of berries on your dress may spell trouble to you because it is hard to remove—but to your ancient ancestor it may have suggested a new source of color.

Many ancient dyes were discovered entirely by accident. The earliest dyes were probably stains from berries, fruits and nuts. Early man liked the color of the stain, discovered it lasted despite the sun and rain, and began to use it to dye his fabrics.

Later, flowers, leaves, stems and roots of shrubs, bark and twigs of trees were found to be good sources of dye. Primitive people of almost every country seem to have developed their own favorite dyes.

Vegetable Dyes First Used

At first, dyestuffs of vegetable origin, available in the neighborhood, were the only ones used. The primitive dyer merely collected flowers, berries, leaves, bark and roots in nearby fields or forests, and boiled them in water to extract the dye. Colors were limited pretty much to red, yellow, green, blue and brown. Few variations in shades and tones were possible.

In time, however, some dyes proved more satisfactory than others. Sometimes this was because the colors were more pleasing, sometimes because they lasted longer. As dyestuffs found in one district were recognized to be superior to those of another, dyestuffs were imported from neighboring regions and trade in them began. Eventually many of the dyestuffs used in ancient times were eliminated as unsatisfactory, so that only a few survived the test of time.

Natural dyes are seldom used today. Chemical dyes, discovered in recent years, have proved so popular that there is little demand for the old-time favorites such as indigo (blue), madder (red), woad (blue), logwood (purple) and fustic (yellow). But many people interested in weaving and embroidery insist that the materials be dyed with natural dyes, valuing the colors for their richness and warmth.

The gay goldenrod blooming in the field or along the roadside is an excellent source of dye. The fresh, bright flowers give a lovely yellow-orange. But dye can also be secured from the faded flowers that have passed their prime or from the dried-up petals that remain on the stalk long after frost. The color, though perhaps not so brilliant as that secured from the fresh flowers, is pleasing and lasts well.

A burnt-orange dye can be secured from the dry brown outer skins of onions. Tea leaves produce a lovely rose-tan. Twigs pruned from apple trees may be used to dye cloth a golden yellow.

Some dyes give their color directly to the wool without any preliminary preparation. For others, the fiber must be specially prepared before it can take the color. Because the auxiliary chemicals make the dye "bite" better into the material, they are called "mordants." This comes from the French word *mordre*, meaning *to bite*.

Alum found in local mineral deposits was used by the Egyptians, Chinese, Greeks and Indians of both America and Asia as a mordant. Today potash alum is considered an excellent mordant. Cream of tartar is frequently used with it to brighten the color. Another popular mordant is potassium dichromate.

Variety of Shades

A given dyestuff can be made to produce a variety of shades or even different colors by using different mordants. Dahlia flowers used with a chrome mordant, for example, on wool produce an orange color. But a light yellow is obtained with alum.

To obtain the desired color or shade, it is often necessary to dye one color over another. Green is produced by dyeing the cloth blue with indigo, then dipping the wool in a dye obtained from goldenrod flowers. To get a light terra cotta, some experts obtain a brass shade from broomsedge, then top-dye the cloth with madder.

Good black dyes are difficult to obtain. Black can be produced, however, by dipping a piece of wool mordanted with alum in the indigo vat, then dyeing it in the brown obtained from walnut hulls. If iron salts are used, black dyes can be made from oak galls, sumac leaves or other plants containing tannic acid.

Pastel shades are the ones most frequently produced with vegetable dyes. Yellow and brown are most likely to be obtained by an amateur experimenting with easily available plants. The better vegetable dyes last well and are improved by the mellowing touch of time.

The amount and intensity of a dye obtained from a plant often vary with the age of the plant. The younger ones usually give a weak dye. A plant with a great deal of water in it usually gives a dilute color. Plants collected in the fall do not necessarily produce the same shade as those collected from exactly the same locality in the spring. It is difficult to duplicate the exact shade of a vegetable dye.

The color of a flower is no guide to

DYESTUFFS—Berries, roots and leaves found everywhere can be used in dyeing.

the shade of dye it will produce. Brightly colored autumn leaves are not a source of dye. Berries are often disappointing.

A dye that is fast on one fiber may not be so satisfactory on another. Or it may be fast when dyed by one method and not at all fast when applied by another. Of all the textile fibers, wool is the best. It can be dyed easily and the resulting colors change the least. It combines with practically all dyes.

For those who want to discover for themselves which plants are a good source of dye, here is a standard recipe that can be tried on almost any plant part, be it blossom, leaf, root or bark. For each pound of cloth, use a peck of fresh dye-plant. Crush or tear into small pieces, then cover with water and soak overnight. Boil the plant for about an hour, then strain off the colored broth. To this dye extract add enough water to make four gallons for the dye bath, place the wool in the liquid and simmer for 30 minutes. Rinse the cloth and let dry.

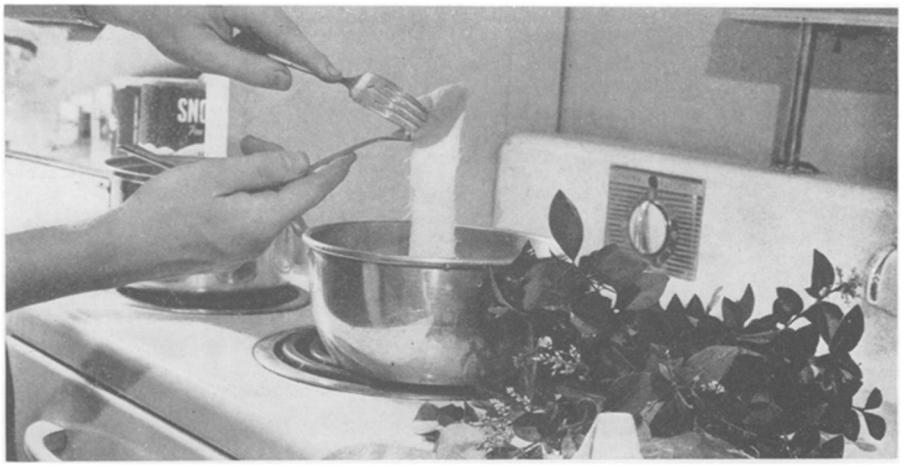
Those who prefer to dye just a small piece of cloth each time until the exact shade desired for a scarf or pocketbook has been produced can use only a handful of flowers, leaves or roots each time. Just be sure to cover the dye-plant well with water when you let it soak overnight and replace the water as it boils away.

Mordant Required

A large number of natural dyes require a mordant. Madder, for instance, produces no color on the wool unless alum, chrome or some other mordant is used. The lovely gold dye of privet leaves is entirely lost if a mordant is not employed.

One of the simplest mordanting recipes calls for four ounces of potash alum, one ounce of cream of tartar and four gallons of water to each pound of wool. After the alum and cream of tartar are dissolved, the wool is immersed in the solution and heated gradually to a boil. After boiling for an hour, it is allowed to cool and the wool remains in the mordant overnight. Then the liquid is squeezed out, the wool rolled in a dry towel and placed in a cool place until ready for use.

The fastness or permanence of a dye is important, but no dye is absolutely fast under all conditions. It may be fast to light, or to perspiration or to washing, but not fast to all three. A number of simple tests, similar in principle to those used in testing cloth professionally, can be applied in the home.



DYE BATH—It is only necessary to boil the raw materials in water to bring out the color. But you may get an entirely different color from what you expect.

A series of cut-outs will show whether a color will fade in the sun. Cut openings an inch square in two pieces of heavy cardboard. With gummed paper fasten the dyed cloth to one of the pieces so that the cloth shows through the cut-out. Cover the cloth with the other piece of cardboard, being careful to have the openings correspond so the light comes through the fabric. Put the frame in the direct sunlight and tilt toward the sun. After a dozen sunny days, comparing the area exposed to the sun with the protected portion will show if the dye is sun-fast.

A two-inch square of dyed wool sewed to a similar piece of undyed wool will help show how water affects the dye. If this is placed in a fruit jar partly filled with soapy water and shaken thoroughly for about a half hour, you can pretty well tell how it will withstand washing. After the water has been squeezed out and the sample rinsed a number of times and ironed dry, unsatisfactory colors will have faded or "bled" onto the undyed piece.

The late summer or autumn garden offers a wide variety of natural dye sources. A large number of experiments has been worked up for the benefit of those interested in obtaining dyes from what is available in and around the home. These, plus three of the ancient vegetable dyes and a mordant are contained in a kit specially prepared for you by Science Service. Just send 50c to Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the Vegetable Dye Kit.

Science News Letter, August 23, 1947

VETERINARY MEDICINE

Sulfur Found To Prevent "Over-Eating Disease"

➤ A TIME-TESTED remedy from grandma's medicine chest has become the newest way of preventing the most serious disease of lambs in the West.

Confronted with the problem of cutting down feeder lamb losses due to the "over-eating disease", technically known as enterotoxemia, four Colorado veterinary scientists decided to experiment with ordinary ground sulfur mixed with the lamb's feed.

Results of this treatment over an extended test period are reported in the *Journal of the American Veterinary Medical Association* (Aug.). They indicate that it was of distinct value in keeping down "over-eating" losses on feedlots. While mortality ranged as high as 8.2% in untreated control lambs, losses of treated animals did not exceed 1%.

The researchers, J. F. Christensen, A. W. Deem, A. L. Esplin, and F. Cross, all of the Colorado Agricultural Experiment Station, said there was some reduction in grain consumption and daily weight gains of lambs fed relatively large doses of sulfur, but no toxic effects were observed. They believe that by reducing the amount of sulfur fed in continuing experiments, the unfavorable effects upon weight gains and grain consumption may be eliminated without sacrificing the benefit of the experiment.

Science News Letter, August 23, 1947

So popular has the insecticide *DDT* become that it is now being produced at a rate of over 3,000,000 pounds a month.