

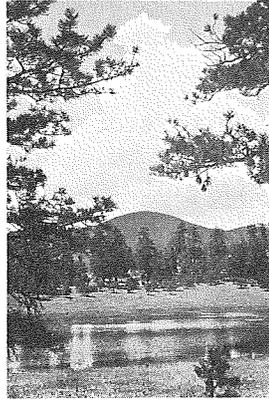
Technical Notes Woodland Conservation



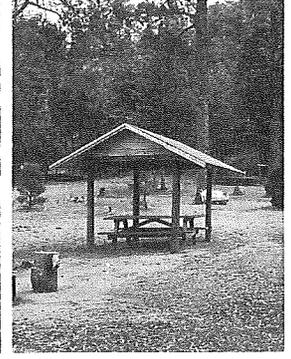
FOREST MANAGEMENT



WINDBREAKS



WATERSHEDS



FOREST RECREATION

U. S. DEPARTMENT OF AGRICULTURE NEW MEXICO SOIL CONSERVATION SERVICE

WOODLAND TECHNICAL NOTE NO. 17

October 30, 1970

SUBJECT: WHY LEAVES CHANGE THEIR COLOR

Autumn colors give the forest a brief moment of glory and provide us with the opportunity to observe and photograph the forest at a most beautiful time of year.

The brilliant colors appear as nights grow longer and temperatures fall. As the nights get a bit frosty a corky "abscission" layer forms where the leaf joins the stem. This layer forms a barrier which prevents water from entering or leaving the leaves. Colors appear only after the leaves have been sealed off.

Rich colors result from chemical changes that take place as the leaf dies and as the complex sugar-producing process breaks down.

It is essential that deciduous trees, those which loose leaves each year, seal themselves in as protection against cold winter weather.

In order to survive trees must guard themselves against loss of water during the period when moisture is not available from the soil where it is locked up in the form of ice. If you observe a twig after the leaves have fallen you will notice scars where the leaves were attached. These scars are where the abscission layer formed.

Leaves serve as food factories during the spring and summer. Carbon dioxide and water are combined with chlorophyll in the presence of sunlight to produce food for the tree. Cool weather causes a slowing down of the vital processes and the work of the leaves come to an end.

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Whatever food there is on hand is stored in the body of the tree for use in the spring. The material remaining in the leaf cells is a water substance containing oil globules and crystals.

The green color of leaves comes from chlorophyll which helps in food manufacture. When chlorophyll runs out of a constant supply of water it breaks down and disappears. As this happens the yellow and orange pigments which have been hidden by the green color become visible.

If the days remain bright and the nights cold the leaf may go on manufacturing sugar until all the chlorophyll is gone. This sugar accumulates and reacts with minerals already present in the leaf to produce the bright reds and purple seen in some species.

Nature protects trees from the weight of snow and ice during the winter. The leaves of evergreen trees are needle or scale-like and shed snow very well. Broadleaf trees shed their leaves and as a result their branches will more easily bear winter's burden of snow. Fallen leaves contain large amounts of valuable elements such as nitrogen and phosphorus. These elements are returned to the soil as leaves fall and are decomposed.

Thus we see that leaf color is only a by-product of winterization and that leaf shedding serves more than one purpose.