

SEED DISPERSAL

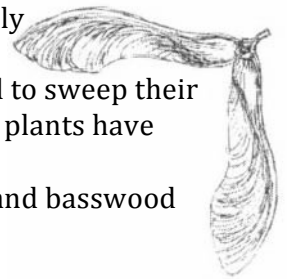
Each season of the year is characterized by a different major activity in the plant world. Winter, in general, is a time for hibernation and consolidation of food reserves. In spring there is tremendous growth activity in most plants. In the long, light days of summer, there is the greatest food manufacture, and most plants are blooming and reproducing. **In fall, in addition to preparations for winter, there is seed production, and dispersal.**

Without the dispersal of seeds to new locations, young seedlings would be competing with their parent plants, often unsuccessfully, for sunlight, soil, water, and nutrients, and the plant's success as a species could well be endangered.

Plants don't move, so how can seeds travel? Among flowering plants, it is at this stage that the seed container plays a vital role, whether it be an apple, an acorn, or a coconut. Plants package their seeds in whatever way best guarantees dispersal. Biologically, the seed is a fertilized, ripened ovule and its container, the ripened ovary. The technical name for flowering plants is **angiosperm**, which translates to seed in a vessel.

The methods which have evolved for the dispersal of plant seeds can be roughly divided into four categories:

▶ **wind:** Some plants grow parachutes or fluffy hairs, which enables the wind to sweep their seeds aloft. Airborne dandelion and poplar tree seeds can travel long distances. Some plants have wings or blades to propel them through the air whichever way the wind takes them. Maple, ash, elm, and basswood trees have such seeds.



▶ **water:** A few seed containers are buoyant and carry their seeds on the water to new destinations. Coconuts are perhaps best known for this, although the seeds of many plants that grow along waterways are at least in part dispersed by water.

▶ **mechanical devices** which are part of the plant itself. There are ingenious seed containers with seams that burst open with such force the seeds explode from the parent plant. Jewelweed gets its nickname touch-me-not from the sudden expulsion of seeds that follows touching a ripened pod.

▶ **animals:** Some seed containers serve as foods for humans or animals who eat them and either discard the seeds or, in storing them, carelessly leave some behind. Squirrels like acorns and forget to retrieve them all. Cherry seeds pass unharmed through the birds that eat them.

Other seeds have sharp hooks or barbs that attach to passersby. Burdocks and beggar ticks are well-known hitchhikers. We'll talk in more details about these below.

VAGABONDS OF THE PLANT WORLD

Seeds and fruits that have developed hooks, spines or other protrusions which engage the hair of the dispersing animals are known collectively as **burs**.

In the *Composite* family, the bracts surrounding the collective head of flowers often become the bristles of the bur. The burdock, *Arctium*, which has one of the most tenacious burs, has bracts which become stiff and hooked at the tip so that the whole fruiting head can become very firmly attached to any rough surface and even to bare skin. According to the "doctrine of signatures" ingesting burdock increased memory because the adhesive nature of the burs was supposed to help facts to "stick to the mind."



One of the most inventive of all composite genera is *Bidens*, the bur-marigold. There are some 20 species in the eastern United States, each one with a slightly different fruit. Some of them have an oval, flattened bur armed with two principal hooks which are themselves covered with smaller barbs. The well-known Spanish needles, *Bidens bipinnata*, have long, thin fruits with two to four awns at the tip, each one covered with tiny, backward-pointing barbs which all easily hook onto any passerby.



Perhaps the meanest of all the composite burs is produced by *Xanthium*, the cocklebur. Probably introduced from Europe and widespread in fields and waste places in the eastern U.S., most of our cockleburs grow several feet high and produce burs with stiff-hooked bristles which really hurt if they stick into your skin.



In the **rose family**, several members produce clinging burs. Agrimony, a tall slender weed with insignificant pale yellow flowers, growing in thickets and open woods, has small, green oval burs armed with several rows of hooked bristles around the middle.



Species of avens, belonging to the genus *Geum*, have soft burs with hooked spines that are surprisingly effective "clingers." Unlike burdock where the hooks are part of a rough covering that surrounds the whole fruit, each hook of a *Geum* bur is attached only to one fruit. If one hook is pulled out, it brings with it only this fruit, leaving a hole in the bur which subsequently starts

to fall apart.

In the **pea family**, (*Leguminosae*) there are several fruits that seem to stick rather than hook, but actually do so by means of minute hairs. Tick trefoil, *Desmodium*, is an elusive plant since one finds the attached fruits far more often than one notices the growing plants. Pods are made up of many triangular sections joined together in a line, the sections tend to separate and stick individually. The outside of the pod is covered with tiny hairs whose hooks are too small to be seen by the naked eye. Inside each section is a little bean-shaped seed. The fruits are often called beggar's lice or beggar's ticks since they are "louse shaped." -- although this name is more often given to various other species of *Bidens* which have squatter fruits.



In the **evening primrose family** Enchanter's nightshade, *Circaea*, is a woodland plant that produces tiny, tear-drop fruits covered with small, stiff bristles.

It is often assumed that the production of large numbers of seeds necessarily assures the success of a species. However, there are a whole cast of interrelated factors involved, not the least of which is an efficient method for dispersal of seeds to good places to grow. Check those old trousers again and make your own list of the species which you think are doing a competent job.