

Beekeeping

Department of Entomology Insect Note

Note 1.07
(Previously Note # 2C)

THE GOLDEN RAIN TREE (*KOELREUTERIA PANICULATA*)

The search for a plant that fits into the homeowner's landscape that also produces nectar and pollen for the bees is the goal of many beekeepers. In North Carolina, the Golden Raintree (*Koelreuteria paniculata*) can fill both of these requirements: it is a beautiful addition to any landscape and it produces nectar during late June and early July when there are few other nectar sources available to the bees.

Description of the Tree: The tree can be grown from seed and it grows at a moderate rate of approximately 10 to 12 feet in the first 5 to 7 year period and at 1 and 1/2 feet per year thereafter. It is well adapted to almost any soil type and it seems to have no serious pest problems. A full grown tree will reach 30 feet in height with an equal or slightly greater branch spread. The shape of the mature tree is a rounded outline with branches spreading upwards. The bark is a light gray-brown. The leaves go from a purplish red when unfolding to bright green at maturity; changing to a yellow or golden color in the fall.

Flowering: Golden Raintree is one of the few yellow flowering trees. It is an asset to any landscape based on just the color of the flowers and the subsequent seed pods in the fall. The flowers are in loose panicles about 12 to 15 inches long. The flowers are very attractive to honey bees. Because there are seldom other plants in bloom at this time of year that are attractive to bees this can be an invaluable nectar source during this off-season. The blooming period is two to three weeks long and it usually begins in late June and runs into early July. The bees in the Raleigh area seem to work the blossoms primarily for nectar and not pollen.

Seed Capsules Fruit: The fruit of the Golden Raintree is a papery capsule, 1-1&1/2 inches long. The capsules are bladder-like seed pods and change from a yellow-green to a deep brown in the fall. The seed capsules can be easily dried to make decorative arrangements. The capsules contain hard, black seeds about the size of peas and these seeds can be harvested to plant new trees.

Preparing the Golden Raintree Seeds for Planting: If time is not a consideration, then the simplest approach is to plant the seeds in late summer or early fall and let nature take its course. The seeds should germinate into seedlings by the following Spring. However, the seeds are controlled by a double dormancy situation and this must be considered if you are planting seeds that have been collected from a tree. Unless you are willing to wait for nature to take its course, then you must weaken the seed coat to make the seed pervious to water and satisfy the requirements of the seed embryo so that it can germinate. These two dormancy factors are: hard seed coat and limited embryo dormancy.

Weakening or Scarifying the Seed Coat: The Golden Raintree seed has a very hard seed coat and this coat must be scarified or weakened. Nature will take care of this over time if the seed is placed in the ground, but you can speed up and control the process. The seed coat can be weakened to permit the emergence of the embryonic plant by one of the following methods:

1. Scrape the seeds with sandpaper or a file until the hard coat is broken through. Be very careful not to injure the young embryo inside the seed.
2. A hot water soak is a very safe and effective approach. Heat water to boiling, remove it from the heat source, add the seeds to the water, and let the seeds soak for 12 to 24 hours.
3. The seeds can also be treated with concentrated sulfuric acid to weaken the seed coat. This treatment is recommended by most horticulturists but great caution must be taken. The acid may be obtained from chemical supply companies. Place the seeds in a dry **glass** container and carefully add the sulfuric acid, about twice the volume of acid as seeds. Let the mixture sit for one hour and then pour off the acid and rinse the seeds with cold water. **CAUTION:** Concentrated sulfuric acid is extremely dangerous and the utmost caution must be used when working with the chemical. Use acid proof containers and chemical resistant gloves. Do not allow the acid to touch your skin or clothes and do not breathe the fumes. Be careful when disposing of the acid. Methods 1 or 2 above are much safer ways of scarifying the seeds with #2 being the safest and most reliable method.

Satisfying the Embryonic Dormancy Requirement of the Seeds: The seeds must be placed in a cold, moist environment for a specified period of time to obtain seed germination. This chilling seed treatment is called moist stratification and provides the proper chemical changes needed by the embryo for its development. The recommended procedure is as follows:

First, scarify the seed coat as previously described in this *Insect Note*.

Second, place the seeds in a plastic zip-lock bag containing a slightly moistened mixture of sand and vermiculite (use four parts soil mixture to 1 part seeds by volume). Place the bag in the refrigerator for 90 days. The ideal temperature is 41° F but a range of 32 to 50° F (-10 to 0° C) will work. Begin observing the seeds after 60 days and remove them from the refrigerator when they begin to germinate or by 90 days.

Planting the Golden Raintree Seeds: After the appropriate stratification and cold/moist treatments have been completed the seeds may be planted. Place the seeds in seed flats containing an appropriate medium, such as good potting soil mixed with a little sand or vermiculite. The soil mixture should hold moisture, drain well, and be light enough to allow for the growth of the young seedling's root system. A good temperature for seed germination is 70 to 75° F, gradually reduced to 65° F after the leaves appear. Transplant the seedlings to larger containers as necessary and transplant into the ground when the plants are large enough to stand on their own. Mulch as necessary and the trees do prefer winter sun. The Golden Raintrees are cold hardy from Zone 5 to 9 and have a life expectancy of about 50 years.

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