

Production of *Magnolia kobus* and *Magnolia virginiana*

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SITE SELECTION

Our primary soil types are Chillum silt loam and Matapeake silt loam. Both of these soils are slightly sloping and well drained. These have a topsoil of 8 to 10 inches thick of moderate fertility. The available water holding capacity is high at 2 to 4 inches. The subsoil is a 20-inch-thick brown silt loam. These are underlain with a yellow-red gravelly sandy clay loam 60 inches thick. We chose this site because in the early spring and late winter we can harvest our crops on a timely basis. This site also provides adequate air drainage for early and late frosts as we are on high ground.

SITE PREPARATION

This task is of the utmost importance as it reduces annual and perennial weed populations, chances of soilborne diseases, and elimination of nematodes.

An application of Roundup (4% solution) is used for elimination of perennial weeds. This is done in two or three applications over the summer months.

In a new field never planted, we apply 50 tons of composted sewage sludge per acre and work this in to a depth of 6 to 8 inches. This is a vital part of our program as it increases organic matter, cation exchange capacity, water holding capacity, and acts as a slow-release fertilizer.

Fumigation with Vapom at a rate of 55 gal acre⁻¹ is used to eliminate weed seeds, soilborne diseases, and nematodes.

The soil is then prepared into raised beds 1 ft high and 4 ft wide with 2 ft of aisleway.

SEED SELECTION

We collect all of our own magnolia seed. Collection is from trees exhibiting superior phenotypic expression such as leaf color, habit, flowering, fruiting, and disease.

SEED COLLECTION

Magnolia virginiana. In southern New Jersey, *M. virginiana* is normally ready from the last week of August to the first week in September. We wait until the follicles have started to expose the red fleshy seeds. A cut test is performed; if this is above 60%, we will collect the seeds. The whole follicle is collected and then spread out on screens one-follicle deep until about 80% of the seeds are exposed.

Seeds are shaken or picked from the follicle and are immediately cleaned to remove the fleshy endocarp. Once the endocarp is removed, the seed is put into 5-gal buckets, stirred in water, and any floating seed removed.

Magnolia kobus. The same process is used with the collection date during mid to late September. Once the seed are cleaned, they are then dried just enough to prevent mold during storage until planting time. Seeds are stored in plastic bags in the refrigerator at 41F.

SEED SOWING — OCTOBER

With *M. virginiana* and *M. kobus* we find that five seedlings per ft² is an excellent density. These plants are very large-leaved and need room to grow. For our market, nurseries want a ¼ to ¾ inch-caliper seedling from 12 to 18 inches to 16 to 24 inches tall.

Since *M. kobus* is used primarily as a rootstock, it is essential that these make a good ¼ caliper for budding or grafting. In our soil type with the addition of the compost we find an added benefit of straight fleshy roots with many fibrous roots.

The seed is then rolled into the bed and covered with an additional ½ inch of fine compost with particles no more than ½ inch.

Magnolia species have an embryo dormancy which is best overcome by fall sowing. We feel fall sowing is best since this is what "Mother Nature" does. Generally speaking, *M. virginiana* and *M. kobus* need a 90- to 120-day cold stratification period for germination.

Germination usually does not occur until mid May in our area. Once germination is complete, after 10 to 14 days, we then hand weed the beds to reduce competition for nutrients and water. The covering of beds with compost provides immediate fertilization which we feel is essential for healthy, sturdy plants.

Once the seedlings have their second set of true leaves we supplement fertilize with a 6-8 month formulation of 17N-6P-12K slow-release fertilizer. This fertilizer is released by water and not by soil temperature; rate is 300 lb acre⁻¹.

In mid June we apply ⅛ pound of active ingredient factor to the beds. By having the sludge wood-chip compost this herbicide is tied up on the bed surface and does not move into the root zone. The herbicide application is activated with ¼ to ½ inch of water — depending upon soil moisture. This is followed up at 21- to 28-day intervals until fall. We do not shade the beds because this allows more photosynthesis and better growth for caliper and height. Herbicide application is followed up with hand weeding.

Along with our other crops, the magnolias are sprayed with Talstar and Dursban alternately at 14- to 21-day intervals. So far the magnolias have not had any fungal problems; therefore, we have not had to implement a fungicide program.

HARVEST AND STORAGE

We harvest most of our magnolia seedlings in the late winter to early spring. Careful attention is given when pulling the seedlings. We harvest with an Egedal digger. They are not completely lifted out of the ground during this operation. The seedlings are then pulled and shaken with some soil left on the roots and covered in bundles to prevent root drying.

When pulling the seedlings from the beds a spray of water is used and plastic tarps are pulled over the harvested seedlings to prevent root desiccation. A 1-0 seedling is of no use after 20 min of drying.

Our magnolia seedlings are stored with moist roots and dry tops. Grading and packing for shipment occur at the same time. This is accomplished by using fibrous sphagnum moss on the roots and jelly rolling them in 6-mil polyethylene plastic. Our experience has been that magnolias do not like storage any longer than 21 days. The cooler is maintained at 36F. We dig and ship so they are usually gone within 7 to 10 days.

IRRIGATION

In our soil type during the summer months we must irrigate for adequate growth. As a rule of thumb we apply 1 inch of water per week. Irrigation is supplied overhead with a traveling sprinkler. This can be accomplished with two workers instead of a whole crew of five or six.

THERE ARE SEVERAL KEY FACTORS IN SEED PROPAGATION OF MAGNOLIA.

Use a well drained soil for prevention of soilborne pathogens. Adequate air drainage is important to avoid early frosts in the fall when the seedlings are still somewhat soft.

In site preparation, elimination of weeds and pathogens is critical for superior growth.

The addition of compost to the soil is beneficial as this increases microbial activity for prevention of diseases. Compost promotes mycorrhizal fungi which allows for greater uptake of water and nutrients.

Application of systemic insecticides is important as a preventative against insects.

Fertilization with soil-building compost and slow-release fertilizer allows for a constant feed as the seedlings need it.

Adequate water of 1 inch per week keeps the seedlings growing for height and caliper. This is followed up by proper hardening off in late summer to early fall.

Weed prevention through hand weeding and herbicide so the seedlings obtain adequate water and nutrient level is important.

Proper handling from harvest, grading, and packing is critical to prevent roots from drying out. This prevents plant stress and increases plant survival.

CONCLUSION

With our program great care is given to the seedlings. As a result our plants survive and grow with little loss.