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Low-Cost Mound-Layering Propagation of Hazelnuts

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Introduction

One of the easiest ways to vegetatively propagate shrubs is through mound-layering (also known as stooling). It is relatively low-cost and with mature shrubs the method can produce 10-20 genetically identical plants in one year. Although the method works for a wide range of shrubs, it is unclear how well it works with the hybrid hazelnuts being grown in the Upper Midwest. This Bulletin reports on a hazelnut mound-layering experiment conducted in 2009 and provides a low-cost method for hazelnut growers to propagate their own plants.

Mound-Layering: Step-by-Step

The goal of mound-layering is to grow vigorous new shoots from the crown of the plant and induce those shoots to produce roots, as is shown in Figure 1. The rooted stems (layers) can then be transplanted just like any other bareroot dormant plant.

Step 1—Producing Vigorous New Shoots

The best way to induce new shoot growth from the crown of a shrub is to coppice the plant in the fall, winter, or early-spring. In this experiment, all the stems of 3 year old hazelnut plants were cut down to a 1 inch height in November of 2008. By early-July of 2009, the plants had sent up an average of 4 new stems per plant with an average height of 8 inches (Figure 2). Vigorous older plants will send up 20-30 new stems with an average height more than 24 inches.

Step 2—Inducing the Stems to Root

The next step in mound-layering is to prepare the stems by weeding out all the small stems and stripping the leaves to have at least 6" of bare stem. The stem is then girdled by tying a twist tie on the base of each stem. Once the twist ties are in place, the rooting hormone can be applied. In this experiment, a 10:1 dilution of Dip N Grow© (0.1% indole-3-butyric acid, 0.05% 1-napthaleneacetic acid) was liberally applied with a small paintbrush to the lower 6-8 inches of the stems.

When you apply the hormone is important.   It should be applied when the stem tissue is still green with little to no bark formation in the softwood or semi-hardwood stage.   In this experiment in far Northern Wisconsin, the hormone was applied on July 16. Researchers at the University of Minnesota working in southern Minnesota and Wisconsin typically apply the hormone in the last week of June or first week of July.

Figure 1. The goal of mound-layering: a rooted stem ready to be transplanted.

Figure 2. New hazelnut shoots on July 16 ready for rooting hormone and mounding.

Step 4—Mounding

Once the rooting hormone is applied, a mound of sawdust piled around the plant will keep the stems moist and provide a rooting medium for the new roots. The more sawdust the better, but the goal is to apply sawdust deep enough to cover the treated part of the stems and wide enough to retain moisture and provide space for root growth. In this experiment, a standard tree grow-tube was used to hold in the sawdust by rolling it into a circle lengthwise and holding it in place with a wooden stake and zip-ties (Figure 3). With the relatively small plants used in this experiment the tubes worked great, but bigger plants would require a larger diameter enclosure. Once the sawdust is applied, it is important to keep it moist the rest of the growing season.

Mounding the coppiced plants with 6" of sawdust in the fall or early-spring when the plant is dormant will force the stems to grow through the sawdust, resulting in an etiolated or softer stem tissue that should be more responsive to rooting hormone. In this experiment, some plants were covered in sawdust on April 15 and others weren't covered until immediately after the rooting hormone was applied on July 16. For the plants mounded on April 15, the sawdust was pulled away from the stems on July 16, hormone was applied to the stems, and the sawdust was replaced. The spring-applied sawdust acted as a mulch and reduced the number of stems per plant. Spring-mounded plants averaged 2.4 stems per plant and summer-mounded plants average 4.8 stems per plant. Even though spring-applied sawdust reduced stem production, the stems that grew up through the spring-applied sawdust were more likely to produce roots (Table 1).

Step 5— Removing rooted Stems in the Fall

Once the leaves have died and the plant has gone dormant, the rooted layers can be removed from the mother plant and transplanted elsewhere. In this experiment, the rooted layers were dug on October 27. To remove the rooted layers, remove the sawdust with your hands being careful to not damage the fragile roots of the layers (Figure 4). Remove the sawdust down to the girdle point and either cut or break-off the stem at that point. You can then transplant the layers to their new homes or over-winter them in a well mulched layer bed and transplant them in the spring or fall of the following year.

Figure 3. A standard tree grow tube rolled lengthwise works great to hold the sawdust in place.

Figure 4. Carefully removing the sawdust will reveal the rooted stems, which can be cut below the roots and transplanted.

Conclusion

Based on the results of this experiment (Table 1) it appears that mound-layering hybrid hazelnuts is a viable propagation option. Rooting hormone is essential and applying the sawdust mound in the early-spring before the plants break dormancy resulted in better rooting, most likely due to softer stems that hadn't formed bark. However, applying the sawdust in the spring will reduce stem growth for young plants. New stem growth from mature plants will be more vigorous and be able to push through the sawdust with little trouble.

Location	Treatment	% rooted stems
1	Hormone	0.0
	No Hormone	0.0
	Spring mounded w/hormone	85.0
2	Hormone	41.1
	No Hormone	0.0
	Spring mounded w/hormone	61.1

Table 1. Rooting success of various mound-layering strategies. Hormone = Rooting hormone and sawdust mound applied on July 16, No Hormone = Sawdust mound applied on July 16, Spring mounded w/hormone = Sawdust mound applied on April 15, hormone applied on July 16 and re-mounded.,