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# Market opportunities: hybrid poplars

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Many northern Idaho landowners are eager to find ways to generate more income from their property. Hybrid poplar production may soon offer a viable enterprise. Hybrid poplar is a cross between different species in the genus *Populus*. Many poplar crosses have resulted in "hybrid vigor" — trees with growth exceeding that of either parent.

Hybrid poplar growth rates can be very impressive. The most productive hybrids tested in Idaho have been crosses between *Populus trichocarpa* (black cottonwood) and *Populus deltoides* (eastern cottonwood). In four years, hybrid poplars planted at the University of Idaho Research and Extension Center at Sandpoint have grown as much as 40 feet high and 5.2 inches in diameter without irrigation.

The impressive growth potential of hybrid poplar has spawned over 50 years of research on ways to use poplar. Uses that have been studied include lumber, plywood core-stock or veneer, paper products, composite wood products (for example, waferboard), fuelwood/biomass for energy production (hog fuel), cattle feed, and cuttings for ornamentals.

## Hybrid poplar demand trends

The hybrid poplar industry is young, so future demand is difficult to predict. If you are interested in hybrid poplar production, you need to know market trends to make good decisions. Currently, hybrid poplar's primary use is for pulp and paper products. Pulpwood consumption has increased steadily in the United States as a result of our growing demand for paper and composite wood products.

In the past, hardwoods (such as poplar) were used only in small amounts in Pacific Northwest paper mills because of available softwood supplies. However, both historical and projected data indicate increasing hardwood pulp use in

the United States. Hardwood use has steadily increased from about 15 percent of total roundwood used for pulp in 1950 to almost 35 percent in 1989. Nationally, the percentage of hardwood in pulp is projected to increase to 41 percent by the year 2040.

Several factors suggest increasing demand for hybrid poplar, including the current and projected timber supply, genetic improvements, and improved processing technology.

## Timber supply

Recent harvest restrictions on public forests have made both softwoods and hardwoods (and their mill residues) more difficult to obtain. Thus, pulp log and chip prices have risen considerably. Consequently, mills are looking for new fiber sources to stay in business. Many Northwest pulp mills use a small percentage of hardwoods, such as alder, black cottonwood, aspen, and birch, in their pulp mixes. Hybrid poplar can substitute for these currently used hardwoods because of similar fiber characteristics.

Mills are particularly interested in hardwoods for pulp if they are sure of having a consistent supply. This recent interest is due to not only the higher coniferous pulp prices but also promises of higher returns for better quality paper products made with pulp containing a higher percentage of hardwood.

## Genetic improvements

Research conducted in Washington and Oregon on poplars for energy production has resulted in poplar clones that are more productive than ever. Continuing research promises further improvements in growth potential, disease and insect resistance, hardiness, and many other desirable qualities.



## Improved processing technology

Improved paper pressing, mechanical pulping, and other wood product technologies are allowing mills to introduce more hardwood species into various products, including paper, veneer, plywood, and waferboard. New uses and pulp mixes may be developed that will incorporate ever-greater percentages of hardwoods, including hybrid poplar.

## Markets

Marketing a product that will be sold in 5 to 10 years is difficult. Future developments can increase or decrease selling prices greatly. However, it is best to choose specific markets and potential buyers before planting, to decrease your financial risk.

## Idaho processors

A recently revised survey of Idaho wood products manufacturers lists 70 primary processors that purchase sawlogs, pulplogs, peeler logs, hog fuel, shavings, chips, or roundwood. Forty-one of these processors are located in northern Idaho, but only three of those listed use hardwoods. Twenty eight secondary processors in Idaho use hardwoods; of those, only eight are located in northern Idaho, and of those eight, six use alder, birch, and/or poplar.

## Pulp and paper mills

A few mills in Oregon and Washington are using hardwoods. For northern Idaho growers, these markets are currently the most available. Many other pulp and paper mills in the Northwest are looking very closely at using hybrid poplar. Fig. 1 shows those companies in the Northwest that are either growing their own hybrid poplar or conducting research on products made from hybrid poplar.

## Lumber, plywood, and composite wood products

Possible market outlets are for lumber, plywood, and waferboard. Weyerhaeuser, near Everett, Washington, is testing hybrid poplar in lumber production, and K-Ply, a Port Angeles, Washington, company is using eastern cottonwood in some of its plywood products with good results. Preliminary testing in other regions of the United States has shown hybrid poplar to be a competitive substitute for softwoods in veneer and plywood production. Foreign interest in cottonwood and hybrid poplar is also increasing.

## Biomass fuel

Many lumber mills generate energy by burning hog fuel (waste material, such as bark, sawdust, odd pieces, etc.). The University of Idaho, located in Moscow, heats most of its campus from a wood-fueled power plant. In some instances, wood-fueled power plants sell electricity to local power companies. One example is Pacific Crown Timber in Plummer, Idaho. This plant uses 10 tons of hog fuel

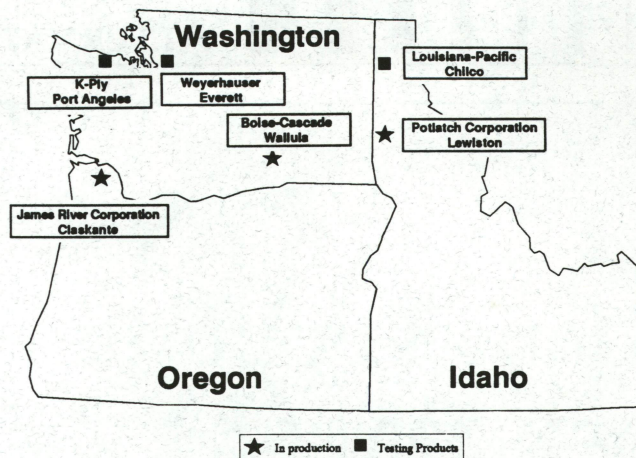


Fig. 1. Pacific Northwest companies currently producing and/or testing hybrid poplar.

hourly and produces about 5 megawatts of electricity per hour.

## Contract vs. open market

Until recently, prospective hybrid poplar producers faced a no-win situation. Companies indicated there would be more of a market for hybrid poplar if a steady supply was available, but no one wanted to sink money into planting poplar until the market was solid. This situation changed when pulp companies began establishing plantations on their own or rented land.

On rented land, many styles of contracts are possible. Some may allow for risk-sharing between the mill and the landowner. At one end of the spectrum, the mill may establish, maintain, and harvest trees; transport logs; and return the ground to the original condition. The property owner receives an annual lease fee. At the other end of the spectrum, the landowner has primary responsibility for the trees. The company usually provides consulting on animal damage prevention, application of herbicides and pesticides, treatment for diseases, and/or other problems that may occur. These contracts often cover the price of the cuttings, lease fees, and harvest specifications. They usually stipulate that the fiber be sold at the current open market price at harvest and give the mill the first right of refusal.

As poplar supply becomes more certain, buyers may also purchase poplar on the open market from independent growers. In this case, mills may pay on the stump, logging and hauling it themselves, or on a mill-delivered price. Hog fuel is usually purchased per ton delivered. Choosing the open market approach is risky since markets are only developing in Idaho at this time.

## Marketing strategy

A marketing strategy is especially important when the market is just developing or uncertain. Components of a marketing strategy include the product, price, promotion, and place of distribution.



## Product

Hybrid poplar production is a very intensive process, particularly when compared to traditional forest management. You must carefully choose which poplar clones are best suited for your land and region. There is tremendous variability in the growth of different hybrid poplar clones, and this variability is compounded by different soils, climate, and other site conditions. Some poplar varieties may be more vulnerable to frost damage, pests, and diseases. Experience in Idaho has shown that growers here must keep poplars free of competing vegetation and protect trees from deer and other wildlife.

Consider experimenting with several varieties in a small planting before committing your resources to a large acreage. A new publication, *High Yield Hybrid Poplar Plantations in the Pacific Northwest*, PNW 356 (see For further reading), provides detailed guidelines on hybrid poplar production. This publication should certainly be read by anyone interested in growing hybrid poplar commercially.

Another key factor in successful hybrid poplar production is keeping establishment costs low — you will have to carry these costs for at least 5 years. One way to keep costs low is through cost-share programs. Several federal cost-share programs offer financial assistance for tree establishment and maintenance. Poplar may or may not qualify in your area, and these programs often require a minimum 10-year rotation age for the trees, so be sure to check with your local Agricultural Stabilization and Conservation Service (ASCS) office for specific program details.

Establishment costs may also be reduced if you create your own stool beds rather than purchase cuttings. The stump sprouts from trees at least 2 years old are harvested annually, cut into 8- to 10-inch pieces, and used as “cuttings” that are planted.

Product quality is also important. Contracts usually specify product attributes, such as chip size, bark content, and other characteristics. If the buyer does the harvesting, this is not your concern. However, if you harvest the trees, pay careful attention to meet or exceed chip specifications.

## Price

Currently, the best index to poplar prices is that of other hardwoods, such as native cottonwood. Percentages of bark, dirt, and moisture content also affect price. Usually hardwood pulp species are purchased by the bone-dry ton, so moisture content will affect the total price of a load. For example, if a mill is paying \$28 per bone-dry ton for chips and the moisture content of a load is 50 percent, then it will pay \$14 per ton (green weight) for that load. Mills may also pay by the bone-dry unit (bdu), which is 2,400 pounds on a dry weight basis.

Hybrid poplar prices cannot be precisely known at planting, since 5 years is the minimum rotation. In infant markets such as hybrid poplar, the seller must often be a price-taker. This means you have no bargaining power and must take what the buyer offers or not sell at all. It is

important to remember that hybrid poplar trees keep gaining in value as long as they are growing. If prices one year look too low, you can wait for a better year. However, there is a point at which the growth rate of the trees slows down to the point where little or nothing is gained by postponing harvest.

Presently, relatively few hardwoods are used by Northwest mills because of softwood availability. As the availability of softwoods falls, then the demand for hardwoods (including hybrid poplar) will no doubt increase, thus causing poplar prices to rise.

## Promotion

Promotion is the means by which you sell your product to a specific market. Since the hybrid poplar industry is young, an extensive market network is not established; however, you can learn who is processing hybrid poplar by contacting the mills in your area. If you contract with a buyer, then your promotional work is done before planting.

If you wait until harvest to find a market for your poplars, you must estimate the volume of wood available for harvest. If you are quoted a stumpage price (where the mill harvests the trees), you need to be aware of your costs — establishment, rent, and maintenance — and what a reasonable profit would be so these amounts can be recovered and earned. If you are quoted a delivered price, you should add harvest, chipping (if necessary), and transportation costs.

## Place

Place refers to the location of your market, your prospective buyers — in this case, mills or power plants that would buy your poplar. Their location is a key factor in determining hybrid poplar production feasibility. Currently, mills and power plants in northern Idaho are either not taking hybrid poplar or are offering very low prices. A few mills in Oregon and Washington are buying poplar.

Chips and logs could be shipped to these mills by truck, rail, barge, or a combination of the three. Logs are rarely shipped by rail unless by company-owned cars due to the high cost of converting railcars to log cars. Transportation costs can be a significant cost factor, even for very short distances. If you are selling on a delivered basis and incurring transportation costs yourself, you must be aware of every step in getting the product from your field to the mill.

The costs of transporting chips and logs are based on different scales. Usually chips are charged on a bone-dry unit, while logs are charged by the thousand board feet (mbf) or by the green ton, depending on transportation type.

Transportation costs include loading and unloading the trucks, barges, and railcars. A “terminal fee” is charged for sorting and banding logs, and loading barges for both chips and logs. Transporting by rail or barge may require trucking on both ends, so there might be an unloading and trucking fee to get your product from the river or rail to the mill.



You should also consider access to your growing site. The surface (dirt or paved) and quality of roads will affect the time needed and cost to harvest and deliver the fiber and which seasons you can get to the site. If farmland is used to grow poplar, access for harvesting and hauling should be relatively convenient.

## Conclusions

A well-considered marketing strategy is critical for success in hybrid poplar production. You must address each element of a marketing strategy — product, price, promotion, and place — before you decide to plant hybrid poplar. Questions you must ask yourself include:

- Do I have a suitable, accessible plantation location?
- Should I contract with a buyer or hope to sell on the open market? If the latter, how do I obtain the highest possible price?
- How do I produce the highest possible volume of fiber?
- How do I keep establishment costs low without sacrificing volume of production?
- Could I get a higher net return by using the site in some other manner (for example, grazing)?

The Pacific Northwest hybrid poplar industry is just beginning to develop. Demand is expected to grow due to higher softwood prices and promises of higher returns for higher quality paper products made with more hardwood pulp. Interest in hardwoods for pulp will grow as mills become confident of a consistent supply.

## Glossary

**Biomass** — logs, chips, or hog fuel (wood residue produced during harvesting or at the mill).

**Bone-dry unit (bdu)** — unit of measurement for chips that is equal to 2,400 green or wet pounds.

**Fiber logs** — logs sold for their fiber content; sometimes included in the definition of pulpwood.

**Hardwoods** — broad-leafed, usually deciduous species (cottonwood, aspen, alder).

**Hog huel** — timber waste such as bark, sawdust, and odd pieces burned to generate heat.

**Hybrid poplar** — cross between different species in the genus *Populus*.

**Peeler logs** — logs that are peeled into thin sheets of veneer.

**Poplar** — any tree or hybrid of trees from the genus *Populus*.

**Pulpwood** — any wood including roundwood, whole-tree chips, and wood residues used for production of wood pulp.

**Roundwood** — logs and other round sections (limbs, tops, etc.) from any area of a tree. May include stumps and even rotten or dead trees.

**Sawlogs** — logs used in the production of lumber that meet minimum regional specifications.

**Softwoods** — needled species (pine, fir, etc.).

**Stool beds** — densely planted poplars used to grow cuttings for planting.

## For further reading

*1992 Directory of Idaho Wood Products Manufacturers*. Misc. Pub. 17. T. M. Gorman, P. C. Gomben, and R. L. Folk. 1992. 65 pages. Forest, Wildlife, and Range Experiment Station, College of Forestry, Wildlife, and Range Sciences, University of Idaho, Moscow, ID 83844-1130. \$5.00.

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*Selling Woodland Timber: Contract Decisions*. B. Schlosser. In press, 1993. University of Idaho Cooperative Extension publication.

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