

Chapter 4—Chips, Shavings and Excelsior, Sawdust, Bark, and Pine Straw

Description of the Product and Its Uses

A variety of products using chips, shavings and excelsior, sawdust, bark, pine straw, and related materials offer supplemental income opportunities for rural residents. Chips, shavings, and bark are usually obtained as by-products from a region's sawmills and secondary wood-processing plants. However, they may be directly produced by small entrepreneurs utilizing wood left from logging operations or wood from thinnings (table 4-1).

Table 4-1. Logging byproducts with commercial potential

Chips	Bark
Sawdust	Leaves
Shavings	Peat
Excelsior	Pine straw

Animal Bedding and Litter Products

Chips, shavings and excelsior, and sawdust from pine, cedar, cottonwood, aspen, basswood, and other woods can be used in animal bedding and litter products. Some of these products have secondary markets as compost. Animal bedding and litter products are used within both the pet and livestock industries. Birds, cats, dogs, small animals (for example, hamsters), reptiles, and amphibians are all associated with litter products, and most of these products use wood shavings. Within the livestock industry, bedding materials are used for stalled horses and cows as well as for many commercial poultry and swine operations.

Cedar tends to be the material that people think of first as a bedding material, since it is used for dog bedding and for small caged animals and is frequently seen in pet stores. Cedar has the advantage of acting as a repellent against fleas and ticks. However, cedar is not used for bedding for scent dogs. Nationwide, pine is probably the dominant wood material sold for animal bedding to both pet stores and livestock and poultry producers because it is the least expensive and easiest to use. Cottonwood is more absorbent than pine, and because of its relative purity (no tannins) it is becoming a popular bedding for use at horse and cattle shows.

In the Northeast, particularly in the State of New York, most sawmills and secondary wood processors have little difficulty finding buyers of the chips, sawdust, and shavings they produce because of use of these products by the dairy industry. In some cases, stocks of sawdust and other byproducts tend to build up in mill yards during the warmer months when farmers do not use much bedding. But even this is becoming less of a problem, since some farmers are beginning to stockpile these materials to ensure adequate supplies when needed. In the Southeast and in the Midwest, however, markets and alternative uses for sawdust are less well developed because it is a less common bedding material. In fact, vast quantities of this material are available. Many mills, because of environmental constraints, consider wood residues an expensive disposal problem.

Soil Conditioners, Amendments, and Mulches

Bark, wood chips, and pine straw have a variety of markets as soil conditioners and amendments, and as decorative landscape mulching products.

For example, finely milled pine bark is sold both as a mulch and as an acidic soil amendment. As a soil amendment, it is valuable because it decays very slowly and encourages root growth. Some experts think there are antifungal chemicals in pine bark that reduce rot and diseases of plants when incorporated into the soil. Shredded hardwood bark is a useful product for mulching and erosion control. Bark mixed with chips can be processed as mulch. And chips composted with sewage sludge can produce potting soil.

Douglas-fir bark is sold in very large quantities throughout the Pacific Northwest.

Pine straw sold for mulch to garden and nursery stores, landscape businesses, and strawberry producers is a good source of supplemental income to landowners in many southern States, particularly Louisiana, North Carolina, South Carolina, Florida, and Georgia. Longleaf and slash pine produce the preferred straw because of their longer needle length, which makes them easier to bail and transport.

Other Products

Chips, shavings, and related wood residues can also be used to make a number of secondary wood products such as particleboard, cedar closet board, fireplace logs made

of sawdust and wax or starch, fuel pellets, and molded products. As mentioned, wood chips, sawdust, and bark can also provide bulking material for composting sewage sludge (Schumann, 1979). Wood shavings can also be used as packing material and in gift packaging where “all natural” products are being marketed.

Market and Competition Considerations

Animal Bedding and Litter Products

There are about 12,500 pet stores across the country, most of which handle some type of animal bedding or litter products. There is obviously a market for this type of product, yet there is also already a fair amount of established competition. *Pet Supplies Marketing Magazine* is a good source of information about the pet industry, and their *1991 Buying Guide and Directory* lists about 25 companies currently dealing in wood shavings as absorbents, litter, and bedding materials.

According to the 1990 Pet Supplies Marketing Survey of independent pet retail outlets across the Nation, the pet industry has managed thus far to resist much of the recession that has affected the rest of the economy. Gross sales of nonfood pet products (a category which would include pet bedding and litter products) in 1990 increased considerably over sales in both 1988 and 1989 for each pet category.

In 1990, about 71 percent of all pet stores sold bird products, 59 percent sold cat products, 64 percent sold dog products, 64 percent sold small animal products, and 49 percent sold reptile/amphibian products. While the nonfood products category includes not only bedding and litter but all other nonfood items such as cages, waterers, and toys, the data do indicate that buyer interest in these products remains quite strong. This would appear to be especially true for birds and small mammals.

The pet industry is still one in which the small entrepreneur who comes up with a new idea or better product can do quite well. Examples are the hooded cat box with a charcoal filter on top, and the new super-absorbing cat litter which has become a very successful update of an old product. Those following the national trends toward recycling and home composting might find a special niche for wood-based litter products, for example, since many litter products sold today would not be appropriate for composting.

The other major market for animal bedding products is in the commercial livestock industry. A regional buyer who could be interested in purchasing these types of materials in bulk would be owners, breeders, or producers of

livestock such as turkeys, chickens, swine, horses, or cattle. Large animal bedding offers as big a market as that of the pet industry. For example, wood shavings used in poultry houses are turned every 8 weeks. A large poultry producer would need large amounts of shavings from large mill operations. There are also opportunities to reuse poultry and livestock litter as a soil amendment or as fuel.

A strategy of marketing animal bedding to producers of large animals as opposed to pet stores would avoid the expense of packaging the bedding materials. This could well be a more practical route to pursue with this product, particularly for the individual who is just starting out with an animal bedding product. By talking with farm supply people, animal husbandry specialists in the State university system, farmer cooperatives, and others, a list of leads could be developed and direct contacts made to determine local and regional markets for these materials in bulk form. Once reliable sales were found, it might also be possible to find a wholesaler to purchase any excess production at a reduced cost but one that would still allow the entrepreneur to cover transportation costs. A trailer truck will carry 70 to 120 cubic yards of shavings, depending, of course, on the size of the trailer.

The Oklahoma Redcedar Association has come together as an organization designed to help landowners and businesspeople develop markets for redcedar, a species that has been looked upon as a “weed” in the past. Several mills in Oklahoma produce redcedar shavings sold for animal bedding, fresheners, potpourri, drilling mud additives, and wood fiber/plastic composites. A large amount comes from neighboring States such as Arkansas. There are also several bedding mills in Oklahoma producing cottonwood shavings for the livestock industry from short (52 inches) roundwood bolts. A 4-cubic-foot bag of cottonwood shavings retails for between \$3 and \$4.

Soil Conditioners, Amendments, and Mulches

Finely milled, clean softwood bark (pine, spruce, fir) is currently selling for \$18 to \$20 a cubic yard in the areas of the country where it is readily available, primarily in the southeastern United States. It is becoming more accepted as a substitute for peat moss and is much cheaper. The pH of softwood bark, generally around 3.8 or 4, is almost exactly that of peat moss. The chemistry of bark is almost identical to peat moss, and bark does not decompose as fast. Furthermore, bark tends to be more uniform than peat moss, which varies depending on where and how it is collected. Since the landscape industry already knows how to use peat moss, there is little change required in production techniques.

Many of the soilless growing media used by the greenhouse industry already contain some quantity of bark, anywhere from 10 percent to 60 percent. The bark is considered a primary component of these media. The nursery industry is becoming a larger buyer of pine bark, readily substituting it for peat moss.

Materials applied as mulches, such as pine straw and bark, protect or improve the texture of the soil and create more favorable conditions for plant growth. Mulches reduce weeds, reduce the evaporation of water in the soil, reduce crusting of the soil (thus improving absorption and percolation of water to the roots), and gradually break down to release organic matter. Mulches help maintain a more uniform soil temperature by acting as an insulator to keep the soil warm during cool spells and cooler during the summer. They also help prevent wind and water erosion and reduce compaction of the soil.

Hardwood bark is less suitable as a soil amendment because of the presence of tannins and growth inhibitors and its high pH. Hardwood bark must be composted before being added to the soil.

Pine straw has become one of the most widely used mulches for residential, industrial, and highway landscape projects, particularly in the southeastern United States. Unlike pine bark, pine straw does not wash away or float out of beds. Because of the interlocking of individual needles, it even holds on reasonable slopes. It is not easily blown away, and unlike leaves, peat moss, or grass clippings, it does not crust or thatch over, a process that prevents the easy movement of air and water to the soil. Clippings can also remain excessively wet during certain periods, which may damage a plant's root system. Pine straw always allows for easy penetration of water, air, and fertilizer to the soil. It is more economical than living ground cover plantings and usually costs less than other mulches. It is easy to apply and is relatively free of insect and disease pests.

It is generally applied at a rate of 1/2 pound per square foot initially, then at 1/4 pound per square foot for annual maintenance.

Distribution and Packaging

Animal Bedding and Litter Products

Setting up some system of distribution of the product is often one of the greatest challenges to a new entrepreneur who wants to be successful with any pet industry product. Where the pet industry is concerned, it may not be practical to bypass local distributors and set up one's own distribution system. In the case of animal bedding, the product is so bulky it requires a fairly large amount of space and most pet stores have very little shelf space. For this reason, most products sold at pet stores get to the stores through a wholesaler, who, in effect, serves as the

independent pet store owner's warehouse. The wholesaler and distributor normally takes 35 percent as his or her margin on these products. Therefore, new entrepreneurs must remember that when they find a store willing to buy their product not to ask their manufacturers' price. Rather, they should sell at a 35-percent markup. In this way, when they find a distributor willing to take them on, the distributor's margin is protected.

Pet product distributorships tend to be quite regional, and most will handle pet shops and farm and garden stores that carry a pet line and are within about 300 miles of the distributor's warehouse. Therefore, it is not necessary for manufacturers of animal bedding products to be near population centers. In fact, several of the largest are in rural areas. There are over 100 distributors who are members of the Pet Industry Distributors Association (PIDA), and they are located throughout the United States. A list of these distributors is available from the PIDA. "Getting it to the pet store" may also require advertising in trade journals, attending trade shows, etc.

Direct sales to commercial livestock operators may require high transportation costs. A shipment by the semiload is generally required if an animal bedding product operation is to be cost efficient. The producer marketing to commercial livestock operators needs to find enough buyers in his or her own region who will carry the product in bulk form to make transportation economical. In the case of the cottonwood shavings bags, for example, transportation costs generally confine the market area to a 150-mile radius.

Most distributors will not repack bulk items unless it is economical for them to do so. So the small producer of chips or shavings must also decide whether to invest in equipment and labor to package or bale the materials or to sell in bulk to a company already in the business of supplying pet stores or other buyers of shavings (for example, companies that specialize in mail order buying that use large quantities of packing materials).

Most animal bedding or other wood shavings producers purchase their slab wood from sawmills at cordwood prices. It would be desirable to be able to find cordwood cut specifically for this purpose in some regions, but it is usually difficult to find individuals willing to go into the forest and cut cordwood for delivery to a small operator. The work is hard and the pay is not very high. Consequently, most people who are producing for the animal bedding market are purchasing their wood from area mills.

Soil Conditioners, Amendments, and Mulches

A potential entrepreneur would be advised to get in touch with local and regional nurseries, landscape companies,

and grounds maintenance companies, to establish a market for the materials. Also, being a source of bark material to manufacturers of artificial growing media would be a good potential market.

Equipment Needs, Costs, and Suppliers

A continuous sawdust dryer machine to allow small sawmills to convert wet green sawdust to dry sawdust in a cost-effective manner is being patented and will be available in the near future (see Resources). Dry sawdust is worth four to five times the value of wet sawdust.

The typical machine needed to create shavings is a Jackson Wood Shaving Mill, which costs about \$30,000. Adding the cost of a building and vehicle and the initial inventory of wood, an estimated \$100,000 would be required to start a wood shaving operation, excluding packaging.

The production of high-quality bark (soil amendments, for example) is greatly affected by the kind of debarking procedure used. A clean debarking system will yield bark which has less than 10 percent wood in it, and which is ideal and immediately salable. Anything with more than 10 percent wood must be composted first. If not composted, the decomposition of the wood in the soil will tie up nutrients, thereby “stealing them” from any plant roots in the same area.

Resource Conservation Considerations

Since chips, shavings, sawdust, and bark are usually a by-product of existing mill operations, no special resource conservation considerations are indicated. The increasing pressure on public landfills has been instrumental in encouraging some States such as Florida to pass laws restricting waste wood deposits. Much of this material is being ground and chipped into inexpensive mulch and ground cover products.

There are advantages and disadvantages to pine straw harvest that will vary with each forest stand. The harvest of the straw reduces fire hazard, but on the other hand, pine straw suppresses the growth of underbrush which would otherwise compete with trees for water and nutrients. The pine straw also acts as a long-term nutrient reservoir, and its removal may be detrimental in sandy soils where longleaf pine stands often grow. Harvesters should take only the top layer of straw, leaving the layer where needles are decomposing.

Special Factors

Chips sold as bedding to poultry producers must have a moisture content of 12 percent or less, be free of bark,

and be free of pesticides. Most large poultry producers test the litter product twice a year for pesticides. No treated lumber products can be used for these materials.

Profiles

Zeager Brothers

Mr. Charlie Zeager of Zeager Brothers in Middletown, Pennsylvania, has developed two new types of mulch products. One is a landscape product which is a combination of bark and much less expensive wood chips. Using a patented process, the company darkens the chips so that they blend in color with the bark. The product is 20 to 25 percent less expensive than straight bark. The mulch is sold in bulk wholesale to landscape contractors and garden centers and is sold retail to public and private institutions such as hospitals, schools, colleges, and industrial and apartment complexes that have grounds to maintain. Most is sold within 150 miles of the company. Labor costs in the area are relatively high, so it is not economical to bag the product since most of the sales are local.

A newer mulch product is one called “wood carpet,” made out of wood chips in such a way that the wood fibers knit together to form a loose mat. It is sold to playgrounds and schools as a playing surface, and to horse farms and horse tracks as a training surface. The chips are laid down about 10 to 12 inches thick, with good drainage, and the wood fibers tend to catch together. The surface provides a cushion to reduce injuries in the case of falls. It will not flame up or freeze up. It is also accessible to wheelchairs.

The company has been aggressively educating the public about the new product, and company representatives typically attend 20 to 30 trade shows a year. Freight costs to ship the product tend to be high, and operations need to be as close to the market as possible. Currently there is nationwide demand for the product and there are three other locations producing it for Zeager Brothers.

Oregon Wood Cents

Mr. Harlis Gardner of Oregon Wood Cents is a semiretired logger who has been in the wood shaving business for about 4 years. He has been pursuing markets in the Pacific Northwest for both animal bedding and packaging materials using a specially designed machine. This machine, developed and being patented by Mr. Gardner, makes shavings that are shaped like long springs or coils. These coiled shavings are uniquely suited to both animal bedding and packaging because they are light, buoyant, and biodegradable. The shape of the shavings keeps them from packing down.

Mr. Gardner obtains his wood from mill trimmings and log ends of cedar and spruce. He uses the cedar for

animal bedding and the spruce for packaging material. The coiled wood shavings can be sold for about \$10 per 12-cubic-foot bag, which makes the product competitively priced with Styrofoam. His machine allows him to make about \$200 worth of shavings a day. He plans to add additional cutting stations to increase that amount fourfold as business develops.

The cedar shavings are a natural flea and tick control. Mr. Gardner has also been working with the University of Oregon in testing the insect repellent qualities of cedar oils. The spruce shavings are used for packaging because they are slightly lighter than the cedar.

As more companies discover the market advantages of being environmentally conscious about every aspect of their business operation, Mr. Gardner feels the advantages of biodegradable packing material will become evident. Companies that are leading the field in environmental sensitivity might even start developing their own packing material. Companies selling fruits and vegetables that need packing materials are especially promising markets for wood packing materials.

With proper financial backing and a good wood source, entrepreneurs in other parts of the country could consider entering the bedding or packaging material market with a similar shaving machine. In addition to selling the shavings to the two types of markets, Mr. Gardner is currently marketing his machine, which can be developed for \$7,000 to \$20,000, depending on how sophisticated the operation is intended to be. Mr. Gardner is also available for consultation.

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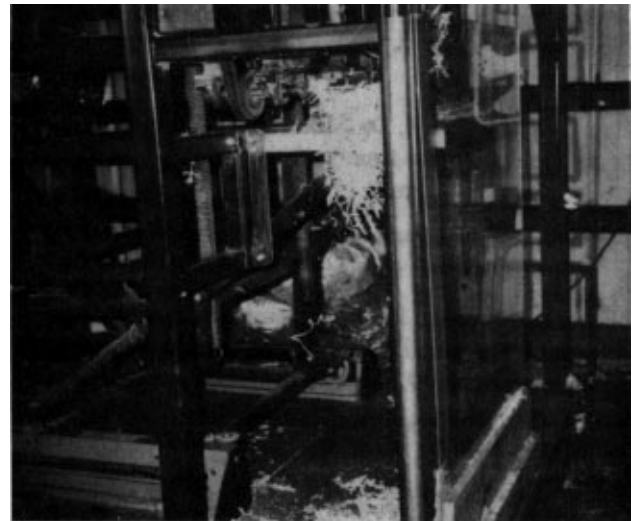
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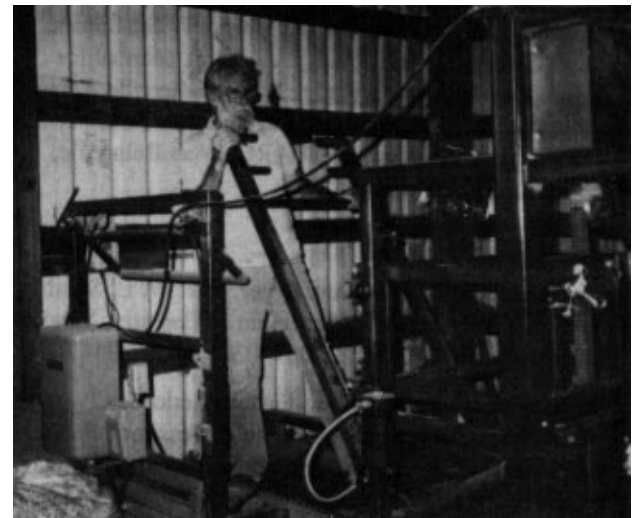
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Machine for shaving wood developed by Harlis Gardner of Oregon Wood Cents, Sweet Home, Oregon. Courtesy of Harlis Gardner. (SFP-14)



Harlis Gardner of Oregon Wood Cents. (SFP-15)

Thomas Martin, Senior Forester, NYS DEC, P.O. Box 220, Warrensburg, NY 12885-0220. 518-623-3671.

John Mixon, Director, Georgia Forestry Commission, P.O. Box 819, Macon, GA 31298-4599. 912-744-3237.

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- Wilson, G. B.; Parr, J.F.; Epstein, E.; Marsh, P.B.; Chaney, R.L.; Colacicco, D.; Burge, W.D.; Sikora, L.J.; Tester, C.F.; Hornick, S. J. 1980. Manual for Composting Sewage Sludge by the Beltsville Aerated-Pile Method. Request from Dr. James F. Parr, Building 005, Room 414, BARC–West Beltsville, MD 20705. 301-344-4281.

Resources

- “On the Continuous Sawdust Dryer.” Dr. W. B. Stuart, Associate Professor, Department of Forestry, Virginia Tech, Blacksburg, VA 24061-0324. 703-231-7674.
- “On Harvesting and Utilizing Eastern Redcedar.” Dr. Steven Anderson, Associate Professor of Forestry, 239 Ag Hall, Forestry Department, Oklahoma State University, Stillwater, OK 74078. 405-744-9431.
- Tom A. Draper, Forest Products Marketing Specialist, 1437A South Highway 63, Houston, MO 65483. 417-967-4188.
- Harlis Gardner, Oregon Wood Cents, 1316 43d Ave., Sweet Home, OR 97355. 503-367-8780.
- Dr. Robert Mills, Forestry Specialist, Louisiana Cooperative Extension Service, Knapp Hall, LSU, Baton Rouge, LA 70803. 504-388-4087.
- Forest Murphy, Director, Sandhills State Forest, P.O. Box 128, Patrick SC 29584. 803-4986478.
- National Bark and Soil Products Association, 13542 Union Village Circle, Clifton, VA 22024. 703-830-5367.
- National Woodland Owners Association, 374 Maple Avenue East, Suite 210, Vienna, VA 22180. 703-255-2700.

Oklahoma Redcedar Association, c/o Carl Bode, P.O. Box 273, Geary, OK. 73040.

Pet Industry Distributors Association, 5024-R Campbell Boulevard, Baltimore, MD 21236-5974. 301-931-8100.

Examples of Active or Innovative Companies

- Les Bilyue, President, Midway Wholesale Distribution Inc., 13140 56th Avenue South, Seattle, WA 98178. 206-243-4926.
- Dick Ernst, Ernst Corporation, 2417 Saratoga Road, Waukesha, WI 53186. 414-544-4760.
- Terry and Ginger Gregory, 515 North Market Street, Belle Plaine, MN 56011. 612-248-3489.
- Robert Hicks, Owner, Rocking Horse Ranch, Route 3, Box 148, Seminole, OK 74868. 405-382-8190; 405-273-0094.
- Kiley’s Wood Shavings, Hillsboro Wood Products Inc., Hillsboro, OH 45133. 800-344-1164.
- Walter Lampp, Fulghum Industries, P.O. Box 909, Wadley, GA 30477. 912-252-5223.
- David Martin, DMLS, Box 232, Lake George, NY 12845. 518-668-5407.
- Larry McDonald, Smithton Industries, P.O. Box 158, Smithton, MO 65350. 816-343-5391.
- Larry Mohrfield, L/M Animal Farms, Pleasant Plain, OH 45162. 513-877-2131.
- Bill Raynor III, Osage Products Company, Box 314, Eldon, MO 65026. 314-392-5000.
- Gary Schiavi, Northeast Products, P.O. Box 98, Old Route 9, Warrensburg, NY 12885. 518-623-3161.
- Alfred Sczepanski, S&S Wood Products, Independence, WI 54747. 715-985-3122.
- Sid Ward, Ward Lumber, P.O. Box 154, Jay, NY 12941. 518-946-2214.
- Equipment Sources**
- Jackson Lumber Harvester Company Inc., Highway 37 North, Mondovi, WI 54755. 715-926-3816.
- Chism Machinery Company Inc., P.O. Box 211, South Avenue, Derry, NH 03038. 603-432-5811; fax 603-432-8851.
- A basic fact sheet for the first-time entrepreneur entering the pet industry is being developed by *Pet Supplies and Marketing Magazine*.