Why Recycle?

- Provide a beneficial use for products that were previously discarded in landfills
- Reduce landfill costs to government and industry and improve environmental quality by removing large volumes of by-products from concentrated landfill disposal
- Improve farm profitability by reducing fertilizer and lime costs
- Contribute to environmental quality and soil conservation by improving the economics of perennial forage crops as an alternative to row crops on more sensitive sites

Before any by-products are delivered to a field, the following requirements must be met:

1. Farmer must sign and follow Best Management Practices (BMP’s)
2. Develop a farm plan, which includes crop rotation
3. Mapping and soil sampling of fields
4. Lease agreement signed if field is rented
5. Notification to township officers prior to hauling to site

If interested in receiving any of these by-products, contact the University of Minnesota Extension Service: Carlton County, P.O. Box 307, Carlton, MN (218) 384-3511 or 1-800-862-3760, ext. 223.
**Bio-Solids**

Bio-solids are rich in organic matter and will provide nitrogen, along with small amounts of phosphorus, potassium, and lime. Additional commercial fertilizer may be needed to meet soil test recommendations. Each site for bio-solids must be approved by the Minnesota Pollution Control Agency.

However, not all fields qualify for bio-solids application due to soil pH, water table level, or slope. Records are kept to ensure that Best Management Practices are followed. Crops that would respond to the nitrogen in bio-solids are corn, grasses, legumes, and small grains.

Bio-solids are provided by the Western Lake Superior Sanitary District in Duluth, and are hauled, spread, and incorporated at no charge to the farmer.

**Lime**

We currently have three sources for by-product ag lime. The largest source is from Sappi Fine Paper of North America who delivers and spreads their lime at no cost to the farmers. This lime is made available as they produce it. The product is only produced during scheduled and unscheduled maintenance of the reclaiming kiln. The Effective Neutralizing Power (ENP) of this lime is 1300.

Cutler-Magner in Superior, WI has been the first source of by-product ag lime. The ENP of this lime is 1840. Loads are delivered with a semi-end dump with loads averaging 23 tons per load. The lime is free and the price farmers pay is based on distance from the plant.

Another source of by-product lime in Northeast Minnesota is from Specialty Minerals, Inc. in Cloquet. The ENP of this lime is 1600. This lime is a wet product that’s good for certain applications. The lime and trucking are free to the farmer.

**Wood Ash**

Recycling wood ash saves valuable landfill space and provides farmers with an excellent liming source, as well as many of the nutrients needed to increase soil fertility. Wood ash increases soil pH and adds elements to the soil, which includes potassium, phosphorus, boron, and sulfur. Wood ash is delivered at no cost, but the farmer is responsible for spreading and incorporation.

There are eight local companies supplying wood ash. Listed below are the companies and the approximate amount of wood ash delivered annually.

<table>
<thead>
<tr>
<th>Company</th>
<th>Tons</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota Power</td>
<td>10,000</td>
<td>800</td>
</tr>
<tr>
<td>Georgia-Pacific, Duluth</td>
<td>400</td>
<td>50</td>
</tr>
<tr>
<td>Ainsworth, Bemidji</td>
<td>10,400</td>
<td>1,340</td>
</tr>
<tr>
<td>Trus Joist</td>
<td>1,300</td>
<td>220</td>
</tr>
<tr>
<td>Jardon Home Brands</td>
<td>125</td>
<td>15</td>
</tr>
<tr>
<td>Sappi Cloquet LLC</td>
<td>20,000</td>
<td>2,800</td>
</tr>
<tr>
<td>Potlatch, Bemidji</td>
<td>400</td>
<td>40</td>
</tr>
<tr>
<td>DNR Fisheries</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>42,280</strong></td>
<td><strong>5,285</strong></td>
</tr>
</tbody>
</table>

**Benefits to participating in the By-products Program:**

- Proven track record with over a decade of beneficial reuse of by-products
- University research used for application recommendations
- Education programs and field days for both industries and producers to share current research data and cropping improvement technologies
- Unbiased 3rd party involvement
- Provide educational programming to local decision makers/residents describing the research on the reuse benefits of these products.
- Assisting producers in developing environmentally sound crop management systems including the use of industrial by-products as soil amendments.
- Develop packets for individual fields including information about land ownership, soil types, soil analysis, and determine application rates based on crop type and soil analysis.
- Develop, research and secure funding for new potential uses for by-products.