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# NEBRASKA FOREST SERVICE



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## Lumber Market



### HARDWOODS

**Northern.** Warm and dry weather patterns have supported increased logging activity. Log prices have remained stable for loggers and log merchandisers. The log supply situation has greatly improved for area sawmills. However, warm weather also causes a transition in species mix and quantities of green lumber purchased. The tighter controls on whitewoods have a strong influence on timing involved from harvest to delivery of freshly sawn green lumber. Part of the commitment for mills to prevent stain is to quickly rotate whitewood log inventories by making frequent production runs. Total sawmill production has improved alongside log supplies.

**Southern.** The emergence of China as a consumer nation rather than an export or re-export country has been beneficial to U.S. hardwood lumber suppliers. Red Oak, along with other open-grained species, has experienced the greatest increase in activity. However, the evolution in secondary manufacturing in China has altered demand for the grade mix. In years past, low grade lumber was the primary quality of purchased raw material. Today, a higher volume of FAS is consumed. The shift has reduced suppliers' inventories of upper grades, but is leaving them with ample #1C. While #1C Red Oak inventories are growing, there was little price movement. Markets for 2A have been bolstered by increased activity for solid wood flooring.

**Appalachian.** Several factors have kept sawmill production from ramping up at a faster rate than it has. First, limited capital has prevented logging contractors and mills from investing in hardwood timber tracks. Secondly, the extended downturn in business has reduced the number of qualified logging contractors available. After prolonged downturn, economic conditions are just beginning to improve. There has been no confidence in future business conditions. Therefore, suppliers and end users have controlled output and purchases. However, there are signs that markets are gaining traction and demand is increasing. Residential construction has momentum, which has spurred finished goods manufacturing and the need for additional raw materials. The overall scope of hardwood activity is more promising.

**International.** Over the past several weeks, major news outlets have reported the demise of the euro and that of many European economies. While no one knows the long-term effects on the overall health of Europe's economy, there is no question business has been negatively affected by uncertainty. But, not all European countries have experienced the same level of decline, and, in fact, continue to post positive economic numbers. Despite severe economic problems, there is ongoing business for hardwood lumber and finished goods in Europe.

Hardwood exports to the EU 27 totaled 40.3 MM bf for the first three months (1Q) of 2012, of which White Oak comprised over 40%. Poplar was a distant second at 21% (8.4 MM bf).

However, the total volume of hardwood exports to China dwarfs Europe. Chinese distributors and secondary manufacturers purchased 109.8 MM bf in 1Q 2012.

(Source: Condensed from *Hardwood Market Report*, May 25, 2012. For more information or to subscribe to *Hardwood Market Report*, call (901) 767-9216, email: [hmr@hmr.com](mailto:hmr@hmr.com), website: [www.hmr.com](http://www.hmr.com))

## Hardwood Lumber Price Trends—Green

Species	FAS				#1C				#2A			
	3/12	12/11	9/11	6/11	3/12	12/11	9/11	6/11	3/12	12/11	9/11	6/11
Ash	845	825	815	800	610	600	580	570	410	410	405	405
Basswood	715	705	705	705	400	375	375	375	205	205	205	205
Cottonwood	635	635	635	635	435	435	435	435	220	220	220	220
Cherry	1355	1355	1395	1415	655	655	655	655	330	330	330	330
Elm	635	635	635	635	420	420	420	420	245	245	245	235
Hackberry	475	475	475	475	455	455	455	455	265	265	265	265
Hickory	700	670	670	655	575	560	560	540	430	415	415	405
Soft Maple	1020	985	920	870	630	600	585	570	340	340	325	325
Red Oak	835	835	900	985	585	585	640	680	490	490	510	525
White Oak	1000	1000	1000	1020	600	600	625	635	450	450	470	470
Walnut	2000	2070	2155	2155	1015	1075	1160	1160	655	705	770	770

Note: Lumber prices quoted in dollars per MBF, average market prices FOB mill, truckload and greater quantities, 4/4, rough, green, random widths and lengths graded in accordance with NHLA rules. Prices for ash, basswood, northern soft grey elm, unselected soft maple, red oak and white oak from Northern Hardwoods listings. Prices for cottonwood and hackberry from Southern Hardwoods listings. Prices for cherry, hickory and walnut (steam treated) from Appalachian Hardwoods listings. (Source: *Hardwood Market Report Lumber News Letter*, last issue of month indicated. To subscribe to Hardwood Market Report call (901) 767-9126, email: hmr@hmr.com, website: www.hmr.com.)

## Hardwood Lumber Price Trends—Kiln Dried

Species	FAS				#1C				#2A			
	3/12	12/11	9/11	6/11	3/12	12/11	9/11	6/11	3/12	12/11	9/11	6/11
Ash	1290	—	—	—	930	—	—	—	745	—	—	—
Basswood	1060	—	—	—	650	—	—	—	455	—	—	—
Cottonwood	780	—	—	—	530	—	—	—	—	—	—	—
Cherry	1960	—	—	—	1065	—	—	—	670	—	—	—
Elm	—	—	—	—	—	—	—	—	—	—	—	—
Hackberry	—	—	—	—	—	—	—	—	—	—	—	—
Hickory	1275	—	—	—	1065	—	—	—	840	—	—	—
Soft Maple	1365	—	—	—	900	—	—	—	670	—	—	—
Red Oak	1395	—	—	—	1025	—	—	—	850	—	—	—
White Oak	1635	—	—	—	1045	—	—	—	830	—	—	—
Walnut	3145	—	—	—	1820	—	—	—	1075	—	—	—

Note: Kiln dried prices in dollars per MBF, FOB mill, is an estimate of predominant prices for 4/4 lumber measured after kiln drying. Prices for cottonwood and hackberry from Southern Hardwoods listings. Prices for ash, basswood, northern soft grey elm, unselected soft maple, red oak, and white oak from Northern Hardwood listings. Prices for cherry, hickory and walnut (steam treated) from Appalachian Hardwoods listings. (Source: *Hardwood Market Report Lumber News Letter*, last issue of month indicated. To subscribe to Hardwood Market Report call (901) 767-9126, website: www.hmr.com.)

# Air Drying Lumber

The drying of lumber is an important process that is required for the efficient use of wood products. A freshly harvested tree will have a significant amount of moisture trapped within the wood cells. For example, a 17-foot log that is 18 inches in diameter at breast height with several inches of sapwood can have approximately 130 gallons of water in its cells. This water represents more than half the total weight of the log. Any lumber manufactured from such a green log will have a high moisture content making it unsuitable for many applications. Proper gluing and finishing are not possible until the moisture content is reduced to an appropriate level. Other advantages of drying include weight reduction, increased strength, and greater resistance against biological deterioration due to fungi and insects. This fact sheet summarizes some of the practical aspects related to air drying lumber.

While kiln drying is usually necessary for lumber to reach the low moisture content needed for bonding or finishing, it is possible to reduce moisture content significantly by air-drying, which involves exposing piled lumber to ambient outdoor conditions.

The main objective of air drying is to evaporate as much moisture from the lumber as possible. Unlike kiln drying, air drying offers little control of the rate of drying and the final moisture content. With air drying, lumber is typically left on stickers in the yard until a moisture content of approximately 20 percent is reached. Drying rate and time depend on environmental conditions such as air circulation rate, temperature, and relative humidity of the outdoor air. The required air-drying time is longer for all species than kiln drying time. Table 1 displays average air-drying time for lumber of various species with one-inch thickness. Air drying is ideal for lumber that is going to be used for a high moisture content application, or as a pre-drying method for kiln drying. Although drying parameters in air drying are not as fully controlled as they are in kiln drying, the relationship between the quality of dry lumber and the drying process should not be overlooked. Lumber quality and drying time are directly related to the beginning moisture content of the lumber and to the moisture content difference between that of the wood and the surrounding environment. Wood loses and gains moisture in an effort to reach equilibrium with the surrounding environment. Moisture content of wood at this point is called the equilibrium moisture content (EMC) and is a function of the relative humidity of the surrounding air. Relative humidity is the ratio of the amount of water vapor present in a quantity of air to the maximum amount of water vapor air can hold at the same temperature. Relative humidity is measured using a hygrometer that consists of both wet and dry bulb thermometers. Wet bulb temperature will usually be lower than that of the dry bulb due to evaporation, which takes place on the damp wick of the wet bulb. Based on the difference between these two temperatures, relative humidity can be determined from Table 2. For example, if the wet bulb and the dry bulb temperatures are 70°F and 75°F, respectively, the relative humidity will be 78 per cent.

## Stacking of the lumber in air drying

The first step in ensuring quality lumber from any drying operation is proper stacking. Improper stacking can lead

**Table 1. Average air drying time for various species.**

<i>Hardwoods</i>	<i>Drying Time (days)</i>	<i>Softwoods</i>	<i>Drying Time (days)</i>
Red oak	70-200	Douglas fir	20-200
White oak	80-250	Eastern hemlock	90-200
Big leaf maple	60-180	White pine	60-200
Red maple	30-120	Red pine	40-200
Silver maple	30-120	White spruce	30-120
Sugar maple	50-200	Sitka spruce	40-150
Birch	50-200	Western larch	60-120
Beech	70-200	Loblolly pine	30-150
Aspen	50-150	Englemann spruce	20-120
Ash	60-200	Sugar pine	15-90
Alder	20-180	Redwood	60-185
Yellow poplar	40-150	Ponderosa pine	15-150

to a variety of problems such as warping, twisting, bowing, staining and increased drying time. Lumber should be sorted based on grade, initial moisture content, species, thickness, and length before stacking to reduce drying time and reduce degradation. Sorting for thickness is important to ensure uniform air flow over the stack and reduce drying defects such as cupping and twisting.

Sorted lumber should be then stacked on a level foundation of large cants that will provide adequate air flow from beneath and allow for access by lifting equipment. Care should be used to maintain space between boards so that the air flow is optimized. Hard maple, beech, oak, or Douglas fir is often used to make stickers ranging from 0.25 to 1.25 inches in thickness and from 0.75 to 2 inches in width. Stickers should be placed at the ends and above each foundation block for every layer. They should be flushed at the ends to eliminate possible end checking and splitting. Spacing between stickers should be from 16 to 24 inches for 1-inch hardwoods. However, wider spacing can be used for softwoods and thicker lumber. Stickers should be carefully aligned as each new layer is laid down to prevent warping within the layers of lumber. Stickers should also be uniform and dry to prevent the transfer of mold and fungi to the stacked wood. Sticker material selection can be very important to prevent sticker stain in some species.

Lumber should be stacked to a height that is easily managed with the equipment available. Individual stacks of lumber may be stacked atop one another provided the bolsters between stacks are properly aligned with the stickers in the individual stacks. Placement of lumber stacks within the wood yard will affect the efficiency of any air drying operation. The stacks must be arranged to facilitate adequate air flow as well as future access to stacks as they dry. Generally, stacks are oriented parallel to the prevailing winds to prevent the upwind stack from blocking air flow to other stacks.

## Modifications of the air drying process

Although air drying ultimately depends on climate conditions, drying times can be reduced and quality may be increased by making basic modifications to the standard air drying method. Modified air drying techniques can be broadly

Table 2. Relative humidity and EMC Values (Relative humidity values are bold and EMC values are in italic type.)

		Difference between wet-bulb and dry-bulb temperature (°F)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dry bulb temp. (°F)	35	<b>90</b>	<b>81</b>	<b>72</b>	<b>63</b>	<b>54</b>	<b>45</b>	<b>37</b>	<b>28</b>	<b>19</b>	<b>11</b>	<b>3</b>	-	-	-	-	-
		-	<i>16.8</i>	<i>13.9</i>	<i>11.9</i>	<i>10.3</i>	<i>8.8</i>	<i>7.4</i>	<i>6.0</i>	<i>4.5</i>	<i>2.9</i>	<i>0.8</i>	-	-	-	-	-
	40	<b>92</b>	<b>83</b>	<b>75</b>	<b>68</b>	<b>60</b>	<b>52</b>	<b>45</b>	<b>37</b>	<b>29</b>	<b>22</b>	<b>15</b>	<b>8</b>	-	-	-	-
		-	<i>17.6</i>	<i>14.8</i>	<i>12.9</i>	<i>11.2</i>	<i>9.9</i>	<i>8.6</i>	<i>7.4</i>	<i>6.2</i>	<i>5.0</i>	<i>3.5</i>	<i>1.9</i>	-	-	-	-
	45	<b>93</b>	<b>85</b>	<b>78</b>	<b>72</b>	<b>64</b>	<b>58</b>	<b>51</b>	<b>44</b>	<b>37</b>	<b>31</b>	<b>25</b>	<b>19</b>	<b>12</b>	<b>6</b>	-	-
		-	<i>18.3</i>	<i>15.6</i>	<i>13.7</i>	<i>12.0</i>	<i>10.7</i>	<i>9.5</i>	<i>8.5</i>	<i>7.5</i>	<i>6.5</i>	<i>5.3</i>	<i>4.2</i>	<i>2.9</i>	<i>1.5</i>	-	-
	50	<b>93</b>	<b>86</b>	<b>80</b>	<b>74</b>	<b>68</b>	<b>62</b>	<b>56</b>	<b>50</b>	<b>44</b>	<b>38</b>	<b>32</b>	<b>27</b>	<b>21</b>	<b>16</b>	<b>10</b>	<b>5</b>
		-	<i>19.0</i>	<i>16.3</i>	<i>14.4</i>	<i>12.7</i>	<i>11.5</i>	<i>10.3</i>	<i>9.4</i>	<i>8.5</i>	<i>7.6</i>	<i>6.7</i>	<i>5.7</i>	<i>4.8</i>	<i>3.9</i>	<i>2.8</i>	<i>1.5</i>
	55	<b>94</b>	<b>88</b>	<b>82</b>	<b>76</b>	<b>70</b>	<b>65</b>	<b>60</b>	<b>54</b>	<b>49</b>	<b>44</b>	<b>39</b>	<b>34</b>	<b>28</b>	<b>24</b>	<b>19</b>	<b>14</b>
		-	<i>19.5</i>	<i>16.9</i>	<i>15.1</i>	<i>13.4</i>	<i>12.2</i>	<i>11.0</i>	<i>10.1</i>	<i>9.3</i>	<i>8.4</i>	<i>7.6</i>	<i>6.8</i>	<i>6.0</i>	<i>5.3</i>	<i>4.5</i>	<i>3.6</i>
	60	<b>94</b>	<b>89</b>	<b>83</b>	<b>78</b>	<b>73</b>	<b>68</b>	<b>63</b>	<b>58</b>	<b>53</b>	<b>48</b>	<b>43</b>	<b>39</b>	<b>34</b>	<b>30</b>	<b>26</b>	<b>21</b>
		-	<i>19.9</i>	<i>17.4</i>	<i>15.6</i>	<i>13.9</i>	<i>12.7</i>	<i>11.6</i>	<i>10.7</i>	<i>9.9</i>	<i>9.1</i>	<i>8.3</i>	<i>7.6</i>	<i>6.9</i>	<i>6.3</i>	<i>5.6</i>	<i>4.9</i>
	65	<b>95</b>	<b>90</b>	<b>84</b>	<b>80</b>	<b>75</b>	<b>70</b>	<b>66</b>	<b>61</b>	<b>56</b>	<b>52</b>	<b>48</b>	<b>44</b>	<b>39</b>	<b>36</b>	<b>32</b>	<b>27</b>
		-	<i>20.3</i>	<i>17.8</i>	<i>16.1</i>	<i>14.4</i>	<i>13.3</i>	<i>12.1</i>	<i>11.2</i>	<i>10.4</i>	<i>9.7</i>	<i>8.9</i>	<i>8.3</i>	<i>7.7</i>	<i>7.1</i>	<i>6.5</i>	<i>5.8</i>
	70	<b>95</b>	<b>90</b>	<b>86</b>	<b>81</b>	<b>77</b>	<b>72</b>	<b>68</b>	<b>64</b>	<b>59</b>	<b>55</b>	<b>51</b>	<b>48</b>	<b>44</b>	<b>40</b>	<b>36</b>	<b>33</b>
		-	<i>20.6</i>	<i>18.2</i>	<i>16.5</i>	<i>14.9</i>	<i>13.7</i>	<i>12.5</i>	<i>11.6</i>	<i>10.7</i>	<i>10.1</i>	<i>9.4</i>	<i>8.8</i>	<i>8.3</i>	<i>7.7</i>	<i>7.2</i>	<i>6.6</i>
	75	<b>95</b>	<b>91</b>	<b>86</b>	<b>82</b>	<b>78</b>	<b>74</b>	<b>70</b>	<b>66</b>	<b>62</b>	<b>58</b>	<b>54</b>	<b>51</b>	<b>47</b>	<b>44</b>	<b>41</b>	<b>37</b>
		-	<i>20.9</i>	<i>18.5</i>	<i>16.8</i>	<i>15.2</i>	<i>14.0</i>	<i>12.9</i>	<i>12.0</i>	<i>11.2</i>	<i>10.5</i>	<i>9.8</i>	<i>9.3</i>	<i>8.7</i>	<i>8.2</i>	<i>7.7</i>	<i>7.2</i>
	80	<b>96</b>	<b>91</b>	<b>87</b>	<b>83</b>	<b>79</b>	<b>75</b>	<b>72</b>	<b>68</b>	<b>64</b>	<b>61</b>	<b>57</b>	<b>54</b>	<b>50</b>	<b>47</b>	<b>44</b>	<b>41</b>
		-	<i>21.0</i>	<i>18.7</i>	<i>17.0</i>	<i>15.5</i>	<i>14.3</i>	<i>13.2</i>	<i>12.3</i>	<i>11.5</i>	<i>10.9</i>	<i>10.1</i>	<i>9.7</i>	<i>9.7</i>	<i>8.6</i>	<i>8.1</i>	<i>7.7</i>
85	<b>96</b>	<b>92</b>	<b>88</b>	<b>84</b>	<b>80</b>	<b>76</b>	<b>73</b>	<b>70</b>	<b>66</b>	<b>63</b>	<b>59</b>	<b>56</b>	<b>53</b>	<b>50</b>	<b>47</b>	<b>44</b>	
	-	<i>21.2</i>	<i>18.8</i>	<i>17.2</i>	<i>15.7</i>	<i>14.5</i>	<i>13.5</i>	<i>12.5</i>	<i>11.8</i>	<i>11.2</i>	<i>10.5</i>	<i>10.0</i>	<i>9.5</i>	<i>9.0</i>	<i>8.5</i>	<i>8.1</i>	
90	<b>96</b>	<b>92</b>	<b>89</b>	<b>85</b>	<b>81</b>	<b>78</b>	<b>74</b>	<b>71</b>	<b>68</b>	<b>65</b>	<b>61</b>	<b>58</b>	<b>55</b>	<b>51</b>	<b>49</b>	<b>47</b>	
	-	<i>21.3</i>	<i>18.9</i>	<i>17.3</i>	<i>15.9</i>	<i>14.7</i>	<i>13.7</i>	<i>12.8</i>	<i>12.0</i>	<i>11.4</i>	<i>10.7</i>	<i>10.2</i>	<i>9.7</i>	<i>9.3</i>	<i>8.8</i>	<i>8.4</i>	
95	<b>96</b>	<b>92</b>	<b>89</b>	<b>85</b>	<b>82</b>	<b>79</b>	<b>75</b>	<b>72</b>	<b>69</b>	<b>66</b>	<b>63</b>	<b>60</b>	<b>57</b>	<b>55</b>	<b>52</b>	<b>49</b>	
	-	<i>21.3</i>	<i>19.0</i>	<i>17.4</i>	<i>16.1</i>	<i>14.9</i>	<i>13.9</i>	<i>12.9</i>	<i>12.2</i>	<i>11.6</i>	<i>11.0</i>	<i>10.5</i>	<i>10.0</i>	<i>9.5</i>	<i>9.1</i>	<i>8.7</i>	

Table 3. Drying time in days of three species for different air drying techniques.

Technique	Maple	Cherry	Oak
Shed-fan	80	90	100
Heated shed	30	70	60
Unheated shed	100	110	120
Outdoor roof	130	150	200

grouped into four categories. These are shed fan, heated shed fan, unheated shed, and outdoor under roof. The main objective of these modifications is to reduce drying time and improve lumber quality by protecting the lumber pile from rain, excessive sun exposure, and by increasing air circulation and uniform distribution of temperature of the surrounding air. Table 3 displays the drying time of 1 inch thick specimens under different drying techniques.

Shed fan air drying is the most commonly used of the four modified air drying techniques. Adding fans on the wall in this method improves the uniformity of air circulation throughout the load. The heated shed method has the advantage of improved air flow as well as rudimentary humidity control, which helps to reduce drying time and offer some control of quality. Unheated sheds simply protect lumber piled under an outdoor roof against rain and direct exposure of sunlight.

### Estimated cost of air drying

The cost of air drying can be estimated by the following equation:

$$COST = T/C [(P + L + V) r + P (x + y) + V(Z)]$$

T: Average drying time per year

C: Yard capacity (bdft)

P: Cost of yard, preparation and road ways (\$)

L: Value of land (\$)

V: Value of lumber (\$/bdft)

r: Interest rate

x: Depreciation

y: Maintenance cost

z: Insurance cost

For example, if 5 million board feet of lumber with a dried value of \$500,000 dries for 10 months and cost of the yard, value of the land, and interest rates are \$60,000; \$10,000; and 5 percent, respectively. The depreciation, maintenance, and insurance cost are 20, 15, and 2 percent, and the yard capacity is 1 million board foot; the total drying cost per 1,000 board foot can be found as follows.

Total drying cost per bdft will be:

$$0.83 / 1,000,000 [(60,000 + 10,000 + 500,000)0.05 + 60,000(.20 + 0.15) + 500,000 \times 0.02] = \$0.0496 \text{ per bd ft or } \$49.60 \text{ per } 1,000 \text{ bd ft.}$$

Detailed information about air drying of lumber can also be found in the following literature:

1. Dry Kiln Operator's Manual. 1991. Edited by William T Simpson. U.S. Department of Agriculture. Forest Service, Forest Products Laboratory, Madison, Wisconsin
2. Air Drying of Lumber. 1972. Raymond C. Rietz and Rufus H. Page. U.S. Department of Agriculture. Agriculture Handbook No. 402
3. Drying Wood with the Sun. 1983. The National Center for Appropriate Technology. PO Box 3838 Butte, MT.

(Source: *Practicalities in Air Drying Lumber*, Oklahoma State University, Extension F-5042 )



# Chiggers-More Than You Ever Wanted To Know!

The worst thing about Midwest summers is not sunburn, heat or humidity—it is chiggers. Not sunburn, heat or humidity—it is chiggers.

Chiggers first show up as annoying red bumps. An itch begins. It grows. More hard red welts surface. From your feet and ankles upward, and especially at those tender locations your mother told you not to scratch in public, a maddening itch takes hold.



Savage scratching begins. Every welt becomes a persistent, exquisitely itching preoccupation that continues to irritate for days and even weeks. You probably recognize these symptoms of chigger bites. Yet we never see the culprits responsible for this summertime agony. What are chiggers? Why do they bite us? How can we stop that horrible itching?

Myths about chiggers are widespread. Many believe chiggers are some type of bug. Folklore tells us they burrow under our skin and die, that they drink our blood and that they can best be killed by suffocation with nail polish or bathing with bleach, alcohol, turpentine or salt water. Surprisingly, all these popular facts are just plain wrong.

## Chiggers are related to ticks

Chiggers are not bugs or any other type of insect. Chiggers are the juvenile (or larval) form of a specific family of mites, the Trombiculidae. Mites are arachnids, like spiders and scorpions, and are closely related to ticks.

Chigger mites are unique among the many mite families in that only the larval stage feeds on vertebrate animals; chiggers dine on us only in their childhood, and later become vegetarians that live in the soil.

Chiggers are tiny—less than 1/150<sup>th</sup> of an inch in diameter. More than a thousand of them could line up across this page and still leave room for two or three hundred more. At this size, chiggers are almost invisible to the unaided eye. However, when several chiggers cluster together near an elastic waistband or wristwatch they can be seen because of their bright red color.

Chiggers are born red; they do not become red from feeding on blood, as some believe. An engorged, well-fed chigger changes to a yellow color.

Under the microscope, you can see that the chigger is an ugly little creature (if it were larger, it could star in any science fiction movie). Although adult chigger mites have eight legs, the troublesome young chiggers have only six.

## Like ticks, they bite and hang on

One of the greatest misconceptions about chiggers is that they burrow into our skin and eventually die within the tissues, thus causing the persistent itch. This widespread myth has its origin in the southern states where pests with similar names such as jigger flea or the chigoes do attack by burrowing under the skin. Chiggers are not equipped to burrow, and they are much too large to enter through the pores.

If chiggers do not burrow under skin or drink blood, what are they doing that itches so much? Chiggers do bite us, much like ticks do. Chiggers attach by inserting minute specialized mouthparts into skin depressions, usually at skin pores or hair follicles. The chigger's piercing mouthparts are short and delicate, and can penetrate only thin skin or where the skin wrinkles and folds.

That is why most chigger bites are around the ankles, the back of the knees, about the crotch, under the belt line and in the armpits. The insertion of the mouthparts is not perceptible. The bite alone is not the source of the itch

## Chiggers suck up liquefied tissue, not blood

The reason the bite itches so intensely and for such a long time is because the chigger injects saliva into its victim after attaching to the skin. The saliva contains a powerful digestive enzyme that literally dissolves the skin cells it contacts. It is this liquefied tissue, never blood that the chigger ingests and uses for food.

A chigger usually goes unnoticed for one to three hours after it starts feeding. During this period, the chigger quietly injects its digestive saliva. After a few hours, your skin reacts by hardening the cells on all sides of the saliva path, eventually forming a hard tube-like structure called a stylostome.

The stylostome walls off the corrosive saliva, but it also functions like a feeding tube for the hungry chigger. The chigger sits with its mouthparts attached to the stylostome, and like a person drinking a milkshake through a straw; it sucks up your liquefied tissue. Left undisturbed, the chigger continues alternately injecting saliva into the bite and sucking up liquid tissue.

It is the stylostome that irritates and inflames the surrounding tissue and causes the characteristic red welt and intense itch. The longer the chigger feeds, the deeper the stylostome grows, and the larger the welt will eventually become. The idea that the welt swells and eventually engulfs the feeding chiggers is also a myth. Many people have seen a small red dot inside a welt (usually under a water blister), but this is the stylostome tube and not a chigger body.

The time required for a chigger to complete its meal varies with the location of the bite, the host and the species. If undisturbed, chiggers commonly take three or four days, and sometimes longer, to eat their dinner. It is not surprising when you consider that this is the first and last meal of the young chigger's life.

## Scratching kills them

On human hosts, however, chiggers seldom get the chance to finish a meal. The unlucky chigger that depends on a human for its once-in-a-lifetime dinner is almost sure to be accidentally brushed away or scratched off by the victim long before the meal is complete.

It may give you some consolation to know that when a chigger is removed before it has fully engorged; it cannot bite again and will eventually die. Seems only just, doesn't it?

## The long-lasting itch is an allergic reaction

Itching usually peaks a day or two after the bite occurs. This happens because the stylostome remains imbedded in your skin tissue long after the chigger is gone. Your skin continues the itch, an allergic reaction to stylostome, for many days. The stylostome is eventually absorbed by your body, a slow process that takes a week to 10 days, or longer.

It is of little comfort to learn that North American chiggers only bite humans by accident. Although our chiggers can feed on most animals, they are really looking for reptiles and birds, their preferred hosts. The itching reaction human skin has to chigger bites occurs because we are not their correct host. Chiggers that specifically prey on humans in Asia and Pacific Islands cause no itching!

## They're fast and attracted to anything new

Unlike ticks, which quietly wait for hosts, chiggers run about almost constantly. Chiggers tend to move towards and

*(continued on page 6)*

# Nebraska Forestry Industry Spotlight



## TROYER SAWMILL



Ron Troyer has lived around Milford, Nebraska all of his life. He grew up watching his family fly planes and always enjoyed building things, either out of metal or wood. Today, Ron flies crop-dusters for a living, is a seasoned welder, and still enjoys making things out of wood.

For the past twelve years Ron has been custom sawing lumber with his portable band sawmill, which he built himself. The carriage was built extra sturdy to handle larger logs. A 35 – 40 Horsepower engine salvaged from Kawasaki four-wheeler powers the sawmill. Ron primarily cuts black walnut, oak, and redcedar, but saws other species depending on demand.

Ron also built his own solar-powered lumber dry kiln about ten years ago to dry the lumber he saws. His kiln has a drying capacity of around 3,000 board feet. When drying conditions are good his solar kiln can dry a stack of one



**Ron with band sawmill and solar kiln.**

inch thick boards in about 40 days. The design for this solar kiln originated from Dr. Gene Wengert who currently is at the University of Wisconsin-Madison, but has also been a professor and extension specialist at Virginia Tech. Ron says the beauty of the kiln is that it is pretty efficient and cost less than \$1,000 to build.

Did we mention Ron likes to build things? Ron has also constructed a tree cutting head which mounts on a skid-loader.

The head features a 24 inch circular saw blade (which he also manufactured). The cutting head was designed to rotate so it has the capability of cutting both horizontally and vertically. Currently, his brother uses the cutting head to clear redcedar, honeylocust, and other weed trees for local landowners.

Troyer Sawmill may be contacted at: 611 7<sup>th</sup> Street, Milford, Nebraska 68405; phone 402-641-5935, e-mail: troyer-ron@alltel.net.

## Chiggers *(continued from page 5)*

onto any new object placed in their environment. You can test your lawn for the presence of chiggers by placing a black piece of cardboard or a white saucer vertically on the ground. If chiggers are present, they will move rapidly over the object and accumulate on the upper edge where you can see them with a magnifying glass.

The chiggers that annoy people have long legs and can move rapidly. They are capable of getting all over a person's body in just a few minutes. The long trek from a victim's shoe to the belt line (a favorite point of attack) is a climb that takes about 15 minutes but is more than 5,000 times the chigger's tiny length. That's about the same as a human scaling a large mountain—and on an empty stomach.

Chiggers are small enough to penetrate the meshes of your clothing, but they usually stay on the surface of your clothes until they come to an easy opening such as your cuffs, collar or waistband. Once they are on your body, chiggers wander about for an hour or more looking for a tender spot to dine. If these traveling chiggers reach an obstacle such as a belt or an elastic band, rather than cross over the obstacle or go under it, they stop and begin to feed.

### **They prefer the tender skin of women and children**

The distribution of chiggers in any area is extremely spotty. Chiggers tend to congregate in patches, while nearby spots of apparently suitable living space is free of them. Of-

ten, people will be heavily attacked while sitting in a chigger concentration area, while the lucky folks sitting only a few yards away will get no bites at all.

Women and children get more bites than men. Folklore says that if chiggers have a choice, they will attack women before men. But the truth is that men, women and children collect the same number of chiggers during a walk in the woods. Women and children just have thinner skin, and thus more surface area that chiggers can easily bite.

### **Avoid chigger-infested areas on warm afternoons**

Chiggers are affected by temperature. They are most active in afternoons, and when the ground temperature is between 77 and 86 degrees. Chiggers become completely inactive when substrate temperatures fall below 60 degrees; temperatures below 42 degrees will kill the chigger species that bite us.

If you can, plan your outdoor activities around your thermometer reading to keep chigger bites to a minimum. Researchers have also found that chiggers actively avoid objects hotter than 99 degrees. Rocks that have been baking in the sun are almost always free of chiggers, and make a safe place to sit when you are in a chigger-infested area.

### **Wear the right kind of clothes**

The first line of defense against chiggers is the right kind of clothing. Shorts, sleeveless shirts and sandals are nearly

suicidal in chigger-infested areas. Wear tightly woven socks and clothes, long pants, long-sleeved shirts, and high shoes or boots. Tucking pant legs inside boots and buttoning cuffs and collars as tightly as possible also helps keep the wandering chiggers on the outside of your clothes.

When you get home, change clothes as soon as possible, and wash them before you wear them again. If you don't, the chiggers will get you the next time you put them on.

Regular mosquito repellents will repel chiggers. All brands are equally effective. Applying these products to exposed skin and around the edge of openings in your clothes, such as cuffs, waistbands, shirtfronts and boot tops, will force chigger to cross the treated line to get inside your clothes. Unfortunately, these repellents are only potent for two to three hours and must be reapplied frequently.

### **Powdered sulphur is the best defense—if you and your friends can stand the smell**

By far, the most effective and time-proven repellent is sulphur. Chiggers hate sulphur and definitely avoid it. Powdered sulphur, called sublimed sulphur or flowers of sulphur, is available through most pharmacies. Dust the powdered sulphur around the opening of your pants, socks and boots. If you plan to venture into a heavily infested area, powdered sulphur can be rubbed over the skin on your legs, arms and waist. Some people rub on a mixture of half talcum powder and half sulphur.

But a word of warning: sulphur has a strong odor. The combination of sulfur and sweat will make you unpleasant company for anyone who has not had the same treatment. Sulphur is also irritating to the skin of some people. If you have not used sulphur before, try it on a small area of your skin first.

Some families have problems enjoying summer backyard activities because of chiggers. The most effective means to eliminate these chiggers is just remove the habitat favored by the adults and juveniles. Clearing away brush and weeds, keeping the grass cut close to the ground and removing conditions which attract small animals that can serve as hosts is the best way to get chiggers out of your yard. Chiggers seldom survive in areas that are well groomed.

### **Take a hot, soapy bath immediately after exposure**

The best precaution against chigger bites is simply taking a warm soapy bath with plenty of scrubbing as soon as possible after exposure. If you bathe at once, while the chiggers are still running over your body, you can wash them off before they bite. A bath will also remove any attached and feeding chiggers before you start to feel the itch.

Warm soapy water is all that is necessary to remove and kill chiggers. There is no need, and it is rather dangerous, to apply household products such as kerosene, turpentine, ammonia, alcohol, gasoline, salt or dry cleaning fluid. Don't do it.

Attached chiggers are removed by even the lightest rubbing. If you are away from civilization, you can remove attached chiggers before they do much damage by frequently rubbing down with a towel or a cloth.

What can you do to alleviate suffering if these precautions fail? Lotions will relieve the itching somewhat, but no substance is completely effective. The only ultimate cure is time, since there is nothing you can do to dislodge the chigger's feeding tube, the true cause of your itch. You must simply wait until your body breaks down and absorbs the foreign object.

In the meantime, local anesthetics such as benzocaine, camphor-phenol and ammonium hydroxide may provide you with several hours of comfort at a stretch. Over-the-counter creams can also help. In rare cases, some people are allergic to chigger bites and require prescription medications from their doctor.

### **Nail polish doesn't work**

The most popular home remedy for which there is little justification is to dab nail polish on the welt. This cannot "smother" the chigger because it has not burrowed into your skin, and it was probably scratched off long ago. The only benefit to applying a thick coat of nail polish is that it helps to remind you not to scratch the bite.

Chronic scratching will only cause the stylostome to further irritate. Scratching deep enough to remove the stylostome will probably cause a secondary infection that is worse than the original chigger bite. If you do scratch, disinfect the chigger bite with topical antiseptics.

Fortunately, in North America the only real danger from chigger bites is secondary infections that develop after scratching with dirty fingernails. Our chiggers do not carry Lyme disease, Rocky Mountain spotted fever, tularemia or any other disease. Some veterans may recall this is not the case in Asia and the Pacific, where chiggers can transmit disease called scrub typhus. Luckily, we have nothing to fear from chiggers except that terrible itch.

There is no creature alive that can cause more torment for its size than the chigger. By at least knowing what your attacker is and how it operates, you can itch less this summer, and get more enjoyment from your outdoor activities.

(Source: *Missouri Department of Conservation website*. Adapted from an article written by Nina Bicknese, former MDC natural history biologist.)



**You know you're  
from Nebraska if...**

You know that "creek"  
rhymes with "pick".



# Timber Sales

The following listings are for stands of timber or logs being offered for sale by owners or persons of delegated authority. Timber was cruised and/or marked for harvest by Nebraska Forest Service or other professional foresters. Volumes in board feet (Doyle scale unless otherwise indicated) are estimates by the forester. If no volume is listed, the trees or logs were not marked by a forester and the listing is included only as a marketing service to the owner. Listings are prepared according to information at the time of publication.

Item	Forester/Date	Contact
1. <b>Walnut</b> (50 trees) 10,100 bf T2073 lot 3 - 27 trees T2075 - 23 trees Veneer 2 - 1,285 bf Veneer 3 - 1,835 bf Lumber 1 - 2,322 bf Lumber 2 - 1,604 bf Lumber 3 - 3,054 bf	Rasmussen Karsten 11/10	Larry Thompson Winnebago Agency RR 1, Box 18, Hwy 75 South Winnebago, NE 68071 (402) 878-2502 Location: Thurston County
<b>SEALED BID ON BIA FORMS.</b> Bids accepted until 2 p.m., Aug. 1, 2012.		
2. <b>Walnut</b> (141 trees) 22,248 bf T3087 - 141 trees Veneer 1 - 162 bf Veneer 2 - 1,022 bf Veneer 3 - 2,564 bf Lumber 1 - 3,997 bf Lumber 2 - 4,671 bf Lumber 3 - 9,832 bf	Rasmussen Karsten 11/10	Larry Thompson Winnebago Agency RR 1, Box 18, Hwy 75 South Winnebago, NE 68071 (402) 878-2502 Location: Thurston County
<b>SEALED BID ON BIA FORMS.</b> Bids accepted until 10 a.m., Aug. 1, 2012.		

# The Trading Post

The *Trading Post* is provided as a free marketing service for forestry industry. Only forestry-related advertisements will be accepted with the exception of products manufactured in the normal course of your business. Please submit written ads to the *Timber Talk* editor at least 15 days before scheduled *Timber Talk* publication dates. Ads may be edited to meet space constraints.

## For Sale

**Sawmill.** Mighty Mite band sawmill. 20 horse electric motor, tandem axles with brakes on one axle, 36" x 24' log capacity, (I have cut 46" beams) hydraulic operation includes winch, knees, taper, near arm, dogging arms, far arm, dogging spike, log loading arms, and electric clutch and blade lift. Also includes automatic blade sharpener, setting machine, 12 used blades and 4 new blades. Excellent condition. Never been used commercially. \$17,500. Contact: Gary Fisher, Crawford, NE. Phone: (308) 665-1580; email: fisher@bbcwb.net.

**Tree Shear.** 14" Dymax Model 2135D1, Double grapple. Used very little. Excellent condition. Fits universal skid loader mounts. \$4,000. Contact: Gary Fisher, Crawford, NE. Phone: (308) 665-1580; email: fisher@bbcwb.net.

**Sawmill.** Circular sawmill. Includes power unit and two 48-inch insert tooth blades. Contact: Monte Reynolds, R&R Sawmill, 75455 Rd 409, Farnam, NE 69029. Phone: (308) 569-2345.

**Lumber.** Rough cut. Air dry. Approximately 500 bf – Black Walnut, 290 bf – Pecan, 100 bf – Poplar, 500 bf – Cherry, 500 bf – Soft Maple, 100 bf – Hickory, 300 bf – Ash. Contact: R&R Sawmill, 75455 Rd 409, Farnam, NE 69029. Phone: (308) 569-2345.

**Walnut Logs and Walnut Boards.** Shedded for 20 years. Boards up to 3 inches thick. Near Pleasant Dale, NE. Contact; Ernie Rousek at 402-488-9032 or email: erousek@neb.rr.com.

**Walnut Lumber.** All dimensions. \$3.00 per board foot. Falls City, NE. Contact: Bruce Walker at (402) 245-2031.

## Wanted

**Logs and Slabwood.** Cottonwood, cedar and pine. 4" to 26" diameter and 90"-100" lengths. Below saw grade logs acceptable. Contact: American Wood Fibers, Clarks, NE at (800) 662-5459; or email: Pat Krish at pkrish@AWF.com

**Cottonwood Logs.** Veneer-quality cottonwood logs, 16" to 36" diameter, 7' and longer. Pick up service available. Contact: Barcel Mill & Lumber, Bellwood, NE 68624. Ask for Barton or Megan. Phone: (800) 201-4780; email: bj@barcelmill.com.

**Horse-drawn or Tractor-drawn grader.** With front wheel dolly. Contact: Carl Hinds, S. Sioux City, NE. Phone: (402) 494-2127 or cell (712) 281-1472.

## Services and Miscellaneous

**Woodshop Services.** Millwork made from your lumber on my planer/molder. Chris Marlowe, Butte, NE (402) 775-5000. Marlowepasture@nmtc.net.

**Sawmill Service and Supplies.** Saw hammering and welding. Precision knife and saw grinding. Certified Stihl chainsaw sales and service. Contact: Tim Schram, Schram Saw and Machine, PO Box 718, 204 E. 3rd St., Ponca, NE 68770, (402) 755-4294.

**Used Portable Sawmills.** North America's largest source of used portable sawmills and equipment. Contact: Sawmill Exchange (800) 459-2148, website: www.sawmillexchange.com.