

**DECLARATION OF DR. DANIEL J. UNDERSANDER**

I, Dr. Daniel J. Undersander, being of legal age do hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: 04/13/2016

/Daniel J. Undersander/  
Daniel J. Undersander  
(electronically signed with permission)

H&S Mfg. Co., Inc.  
v. Oxbo Int'l Co.  
IPR2016-00950

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## **I. Introduction**

1. I have been retained by H&S Manufacturing as an expert in connection with petitions for Inter Partes Review of U.S. Patent Nos. 7,310,929, 8,166,739 and 8,863,488, as well as in connection the related federal district court proceeding (*Oxbo Int'l Corp. v. H&S Mfg. Co.*, No. 15-292-jdp (W.D. Wis. 2015). This Declaration is my direct testimony in relation to forage, forage harvesting practices, equipment for forage harvesting, and other matters I was asked to address. In making this Declaration, I have reviewed the common specification of the U.S. Patent Nos. 7,310,929, 8,166,739 and 8,863,488.

## **II. Qualifications and Compensation**

2. I am a Professor of Agronomy at the University of Wisconsin-Madison and have held that position since 1988. Also since 1988, I have been actively involved with the University of Wisconsin Forage Research and Extension. My responsibilities with the Extension service regularly require me to be in the field working with and training farmers and industry groups in forage management. Because I have spent my entire career in this field, I have great familiarity with forage harvesting practices and the equipment used to accomplish the harvest.

3. I have more than 40 years experience with hay and haylage making. Over this period, in addition to my hands-on field work, I have conducted research activities, published articles, presented seminars, and trained forage industry workers concerning forage harvesting practices and equipment. During my career, I have written over 1300 publications related to forage production and harvesting management. My qualifications are presented more fully in my curriculum vitae, which is attached to this Declaration as Appendix A.

4. I do not have any previous experience in court proceedings.

5. I am being compensated for my time spent reviewing materials, forming my opinions and in preparing this Declaration at the rate of \$200 per hour. My compensation is not contingent upon my testimony, the outcome of the proceeding or any testimony that I may give.

### **III. Forage**

6. Forage is the vegetative portion of plants (leaves and stems). Forage includes plant species such as alfalfa, clovers, grasses, wheat, oats, barley, sorghum, and sudangrass. Forage is grown for multiple purposes including reducing soil erosion, increased carbon fixation and animal feed. Ruminant animals such as cattle, sheep, bison and horses (technically a non-ruminant but with enlarged cecum for forage digestion) have evolved using grasslands as a

primary source of food. These animals can digest the cellulose in forage, which non-ruminants (including humans) cannot. Further, these animals require the fiber from forage for good health. (Van Soest, 1982; National Research Council (“NRC”), 2000; NRC, 2001)

7. A primary consumer of harvested forage is dairy cattle, due to the high energy and protein needs of milking cows. In the United States, approximately 40% of harvested forage (60 to 70% of the alfalfa) is fed to dairy cattle. The remaining 60% of harvested forage, including alfalfa and grass, is used for beef cattle, horses, sheep and other livestock.

8. Forage is generally harvested as either hay, or haylage. “Hay” is forage which is harvested after drying down to a moisture content of 14% to 20%. Hay is harvested into bales. Equipment for harvesting hay is known as a baler. Bales of hay are usually round or square and may range in size from 50 lb to 1 ton. Once baled, the hay must be stored in a dry place.

9. Some advantages of hay include the simplicity of storage and feeding, and less expensive equipment for harvesting. Some disadvantages of hay include the amount of time required for forage to dry down to the necessary 15% or less moisture content, which can be 3- to 6-days. This period of time can be difficult to reliably achieve in some regions or climates, due to the prevalence of rainfall.

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