Fact Sheet
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Farm Safety Association

NOISE -- SOUND WITHOUT VALUE

INTRODUCTION

Poor Hearing -- a natural consequence of growing old? Such is not the case with many farmers. Studies have shown that some farmers experience substantial noise induced hearing loss by age 30. Many types of modern farm equipment emit noise far in excess of recommended levels. Prolonged exposure to excess noise levels can result in permanent hearing loss, unless some type of noise control measures are utilized.

SOUND AND NOISE

Sound is radiant energy that is transmitted through space by longitudinal pressure and is the objective cause of hearing. Normal ears can detect sounds of minute intensity as well as extreme intensity. Noise is best described as unwanted sound of sufficient intensity to damage hearing. The measurement of sound or noise is related to pressure, frequency and duration, and is commonly measured in units called decibels.

HOW NOISE DAMAGES HEARING

Noise-induced hearing loss seldom involves total hearing loss or deafness. However, the damage cannot be repaired and hearing aids can do little good. Constant exposure to noise affects the inner ear. The first sign of hearing damage is an inability to hear higher pitched sounds; with continued exposure to noise, the ability to tell musical tones apart becomes impossible. Eventually, with continual exposure to excess noise, the ability to hear normal conversation is impaired.

Noise is too loud when:

1. Your ears ring after prolonged exposure to noise (temporary threshold shift).
2. Speech and other sounds seem muffled after exposure.
3. You lose the ability to tell musical tones apart.
4. You fail to hear high pitched sound.

HEARING -- AN IMPORTANT ASSET

Next to eyesight, hearing is the most important asset humans have. Noise can lead to fatigue and reduce work output. Loss of hearing means that one of our most important warning devices is impaired.

DECIBEL -- A UNIT OF MEASUREMENT

The softest sound audible to humans is zero decibels; normal conversation measures approximately 65 decibels. Noise in excess of 120 decibels causes acute pain to the ear. Even brief exposure to noise levels of 120 decibels can result in a short lived hearing loss called temporary threshold shift. The ringing sensation that is sometimes experienced after operating a diesel tractor is a good example of this temporary shift. Normal hearing will usually return over a period of a few hours. However, continual exposure to noise at high decibel levels over a period of time may lead to permanent hearing loss.

The decibel measurement, similarly the ear, follows the inverse square law and as the distance from the source of the noise increases, the decibel level

decreases as the square of the distance. For example, if you were located 5 feet from a noise source and moved 10 feet from the noise source, the noise level would drop to one-fourth of the level at 5 feet.

DECIBEL LEVELS OF COMMON SOUNDS

0	Acute threshold of hearing
15	Average threshold of hearing
20	Soft whisper
30	Leaves rustling
65	Normal conversation
70	Inside an automobile at 60 m.p.h.
80	Heavy traffic
90	Recommended level for 8 hour exposure
100	Tractor under load, motor cycle, snowmobile
120	Jack hammer, amplified rock music

Recommended levels for noise exposure have been incorporated into many types of safety and health legislation in Canada. These limits should serve as a guide to all persons involved in agricultural work. The Ontario Industrial Safety Act, 1971, sets forth the following limits:

Sound Level (Decibels)	**Exposure Period/24 Hours**
90	8
92	6
95	4
97	3
100	2
102	1 1/2
105	1
110	1/2
115	15 minutes or less
115	No exposure

Note: Research has indicated that these limits should be altered somewhat. Future recommended levels will likely state 85 decibels for an eight hour exposure.

NOISE CONTROL

Noise control involves three distinct areas: (a) source of noise, (b) path along which the noise travels, and (c) the ear. Modifying the redesigning the source of noise can reduce noise levels. By

interrupting the path of noise with a barrier such as an insulated tractor cab, noise can be reduced. Finally, noise damage to ears can be eliminated by using ear protection and limiting the exposure time.

FARM MACHINERY

The list of farm machinery capable of producing noise-induced hearing loss is endless. Many manufacturers of farm equipment are now designing their equipment to reduce noise.

However, the nature of farm equipment and the manner in which it is used, will continue to make noise a problem area for quite some time.

TRACTOR CABS

Fully insulated tractor cabs are now available for most popular makes of tractors. Improvements in mounting techniques and the use of acoustic materials have allowed many manufacturers to produce a cab that meets recommended noise levels.

EAR PROTECTION

If other means of noise reduction cannot reduce noise to acceptable levels, ear protection should be worn. Ear protection is available in two forms, acoustical ear muffs and ear plugs. Both ear muffs and ear plugs will effectively reduce the level of noise entering the ear, but will still allow you to hear your equipment running.

Ear muffs and plugs are available from safety supply companies and are also available from many farm supply outlets. When buying ear protection, remember that a good fit is compulsory in order for these devices to function properly.
