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GUEST COLUMN

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The next 20 years will complete a century of recorded history of veterinary medicine in North Dakota. What do these 20 years hold for animal disease problems for North Dakota stockmen?

Much has taken place in animal disease since Dr. Van Es and Dr. Robinson arrived in 1903. Diseases that they had to deal with such as glanders, tuberculosis, scabies, brucellosis and hog cholera have been eradicated. Note that three of the five diseases are bacterial.

Present day problems include bovine virus diarrhea, respiratory syncytial virus, infectious bovine rhinotracheitis, pseudorabies and progressive pneumonia; all virus diseases. The easy problems have been licked, the tough ones remain or are emerging.

Lurking over the horizon are any number of foreign diseases posing a constant threat of devastating disease problems for our stockmen. Diseases such as rinderpest, foot and mouth disease, African swine fever, Rift Valley fever, lumpy skin disease, bovine pleuropneumonia and Teschen disease, to name but a few, threaten our animal populations, mostly due to international air traffic. Introduction of foreign diseases by means of rapid air travel is usually the result of ignorance. Gar-

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On the Cover: The two newest facilities devoted to livestock research and teaching at the main station in Fargo are the dairy unit (foreground) and the recently completed swine barn. Photo by James Berg.

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The depth of the rut depended on the location of the tower from the pivot. Tower number 1 from the pivot had a mean rut depth for three seasons of .41 feet and was significantly different from all the towers. Tower number 2 had a mean rut depth of .30 feet and was significantly different from towers number 1 and 6. The depths of the ruts for towers 3, 4, 5 and 6 became shallower as the measurements moved away from the center of the machine but were not significantly different from each other. Mean depths of wheel ruts over three irrigation seasons for towers 1, 2, 3, 4, 5 and 6 were .41, .30, .26, .26, .25 and .24, respectively. These data suggest that the longer a tower remains in one place, the deeper the wheel rut will be since the innermost towers travel at a slower pace over the field.

Summary

Three variables were found to significantly affect the depths of wheel ruts with center pivot irrigation on silt loam soils. They were the year, working weight of the system and location of towers from the pivot point.

The wheel ruts in year one were significantly shallower than in years two and three. There was no difference in mean rut depths between years two and three. A statistical analysis suggests that the depths of wheel ruts were dependent on growing season precipitation and amount of irrigation water applied as they relate to number of revolutions. Lesser amounts of irrigation water and growing season precipitation were observed in year one. Tillage methods were relatively the same and the crop rotation was not altered between years.

The working weight of the systems used also statistically affected the depth of the wheel ruts. Three-year mean wheel rut depths were significantly different between the two types of sytems but the actual measured difference for the period was only .48 inch.

The towers closest to the pivot point of the center pivot irrigation system make deeper ruts than those towers located outward (Figure 2). Theoretically, this is possibly due to the towers closest to the pivot point moving more slowly than towers located further outward. As a result, the longer the length of time a tower remains in one place, in saturated soil, the deeper the wheel ruts will be.

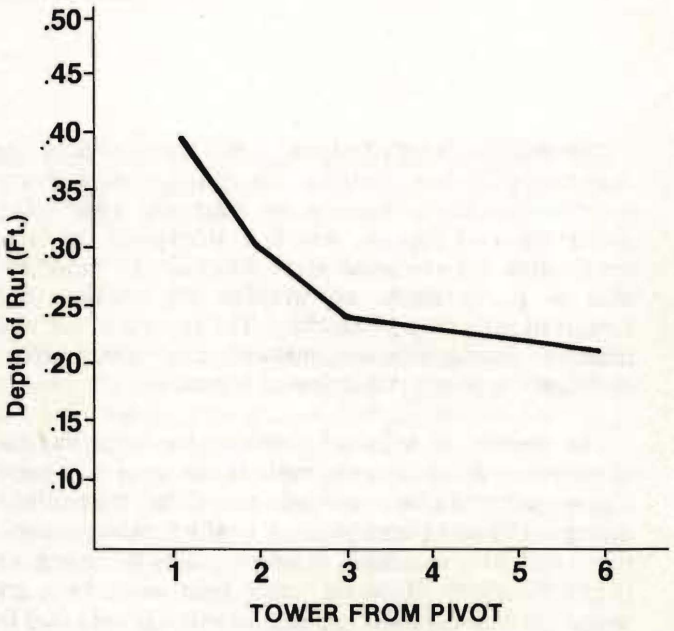

Figure 2. Mean Wheel Rut Depths for 3 Irrigation Seasons By Tower.

*The author wishes to thank John Gardner for his statistical assistance.

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bage dumped from international airliners at military or civilian air bases is an excellent method of introducing foreign diseases. Specialty meat products such as uncooked sausage find their way into this country in luggage. Hunting specimens headed for the taxidermy shop provide an additional method of introducing new disease. These are not theoretical possibilities; these instances have occurred in North Dakota. Fortunately no disease agents that we know of have been transmitted by these methods.

Another very real threat is the introduction of new or previously significant disease agents across our state borders from other states. Unfortunately these situations are often brought about by illegal entry of livestock and is often by intent rather than ignorance. In this category we can list such diseases as anaplasmosis, blue tongue, brucellosis, tuberculosis, and scabies.

What are we doing to cope with these present and potential disease problems? First of all we are very fortunate to have in North Dakota a cadre of dedicated, bright and experienced veterinary practitioners. These veterinarians form the first line of defense against animal disease. An extension of these veterinary practices is the accredited full service veterinary diagnostic laboratory at the Department of Veterinary Science. The information and materials flowing from the diagnostic laboratory are fuel to feed the fire of research in the department.

Much work needs to be done and is being done in our research areas to answer the disease questions in North Dakota, the region, and the nation.

It is simplistic to feel that solutions to all our problems will be forthcoming in the near future. However, we can be comfortably assured that the continuum in disease prevention, detection and treatment involving stockmen, veterinarians, diagnosticians, and research people will do its best to safeguard the health of our animals.

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