the universities, and the federal Government. This is a type of co-ordinated effort which we have not had in the past, and we feel that our objective of characterizing the nutrient requirements of plants on different soils will be materially aided through the co-ordinated efforts that we are now exercising, and this goes back to what Dr. Ripley says, that we can do much in this land use proposition through existing agencies which we now have. It is just a matter of making them more efficient in their use and organizing the personnel and physical staff which we have to get the information we want.

Now, Dr. Ripley showed you figures in his publication to indicate that per acre of arable land per year Canada is using about 4½ tons of fertilizer. This is a very low figure because the soil to give us our best production, our most economical production, requires larger quantities of fertilizer. You may apply 4.4 pounds of fertilizer per acre and lose money in your crop production but if you were to apply 40 pounds per acre you would make money. This is one of the problems we have. Many farmers have applied small quantities of fertilizer and found that it was not a profitable investment for them and stopped using it, whereas if they applied more of it they would soon have discovered that it was a good investment. If we were to use as much as they use in the United States per acre we would be using 20 pounds per acre and it would be over 1 million tons in Canada instead of maybe 220,000 tons. So we feel that through the use of fertilizers we have a great potential in crop production and we can, as Dr. Ripley suggested, double in many instances our yields through the use of adequate quantities of fertilizer.

The CHAIRMAN: Does moisture have anything to do with the effectiveness of fertilizer?

Dr. NIELSEN: Yes it does.

The CHAIRMAN: If you happen to be in dry areas and use fertilizer will it be effective?

Dr. NIELSEN: Now I can tell you you are not going to get the response that you should get. For instance in south western Saskatchewan the use of fertilizer is questionable because there is not sufficient moisture to give you the advantage of the supplemental nutrients. But even there we have gotten some responses. It is a problem that has to be worked out and in doing so you have to take into consideration your moisture supplies, the type of soil, the type of crop and your economic situation.

Senator HAWKINS: I am interested when you say that if you use twice as much it might give you far better results. That is amazing isn't it?

Dr. NIELSEN: Yes. And I think that a lot of farmers do not realize that.

Senator BRADETTE: Mr. Chairman, may I ask Dr. Nielsen this question: Are you satisfied with the content of fertilizers? I have sent fertilizers to the National Research Council for analysis and I found out that they were not fertilizers and I was astounded because it was bought from a reputable dealer. I was really astounded at the lack of quality in that fertilizer. Do you wish to make any comments on that? Are there any necessary precautions to be taken?

Dr. RIPLEY: Mr. Chairman, may I comment on that? We have of course the Fertilizer Act which is administered by the Department of Agriculture and our Production Service. At any time a purchaser can have the fertilizer analysed by our production service and if it falls below grade the dealer or seller of that fertilizer is subject to legal action. I believe the act is pretty well administered. I am sure that mistakes can happen and probably some companies, and I think as a general rule the big ones, the well established companies do a pretty good job of putting out a reliable and dependable