If this sugar beet foliage high in nitrate is used for cattle feed, they are in danger of nitrite poisoning.

We in agriculture feel there is a great opportunity to develop technology of providing crop plants with ammoniacal urea, or other forms of nitrogen so that the nitrogen does not go through the nitrate stage.

Mr. DADDARIO. Everything that you say is somewhat frightening because we are beginning to develop nitrogen fertilizer plants all over the world with tremendous capacities. Mr. George Woods, President of the World Bank, before our committee, cited as a particular example our ability to meet some of the food problems in India and other places. There is now developing a capability where we expect to get production to quadruple or even be better than that.

Dr. WADLEIGH. Correct.

Mr. DADDARIO. So we will be using the same kind of fertilizer in an ever increasing amount despite the dangers which might accumulate, as you have spelled them out here today, Doctor.

Dr. WADLEIGH. I think there is a lot that could be done to improve the situation.

Mr. DADDARIO. Tell us about that. What do you think ought to be done?

Dr. WADLEIGH. The main effort needed is a concentrated study into the efficiency of the use of fertilizer by different crops. There has not been any pressure for increased efficiency of use because nitrogen fertilizer is so cheap. It is much cheaper now than it was back in the twenties. I grew up on a farm in Massachusetts.

Mr. DADDARIO. I could tell you came from Massachusetts.

Mr. GRANT. Since I came from New Hampshire, we really are quite close together.

Mr. DADDARIO. Where was your farm?

Dr. WADLEIGH. Southbridge. Nitrogen would cost 20 or 25 cents a pound when we were buying sodium nitrate back in the twenties. Now farmers are able to apply it on for 8 cents or 9 cents a pound. It is the cheapest commodity they can buy for improving their yields. We need to know more about the forms that we can put into the soil, where it should be placed in the soil, and at what time in the physiological growth of the plant so that it produces the maximum yield, and yet have the soil nearly exhausted of nitrate by harvest time.

The difficulty in many areas is that the nitrate accumulates and it is in the soil at the end of the harvest. Those who are acquainted with the sugar beet industry of the Western States know processors are deeply concerned with the deterioration of the quality of beets associated with nitrogen accumulation at the end of the season. We need far better information of the forms of nitrogen fertilizer to use that will not be readily leached out; where exactly this should be placed in the soil to provide maximum benefit to the plants: the time in the physiological growth of the crop when nitrogen availibility would be most beneficial; and the development of varieties of plants which have high efficiency in using available nitrogen.

Some of you may be acquainted with the large sugarcane industry on the muck soils of Florida. When conventional sugarcane varieties were cultivated on that muck, they would not produce commercial crops of sugar. There was too much nitrogen in the soil. It runs nearly