

ROUND-TABLE DISCUSSION

(Where identity of speaker was not recorded, "Individual comment:" signifies the speaker.)

Spears: The prospects for sunflowers as a crop in the Western Hemisphere cover several countries represented here and a number of states in the U.S. Within any state the influence of climate may affect the adaptability and prospects of the crop in parts of the state. I would personally like to hear more about some of the economic aspects by people here from industry and about the prospects of our market in this Western Hemisphere. As we stand today, do we have the possibility of rust resistance? Raymond, you mentioned the problems encountered at Lubbock on insect control. Do we have practical control methods with insecticides that in this country would comply with Food and Drug Administration regulations? Perhaps we can bring out some of the cultural practices that might be required to fit the crop into our farming systems. Some of you have mentioned things that are desirable from the standpoint of rotations (such as in Minnesota), rotation with soybeans was desirable for both crops. So, I am hopeful that each and everyone will make contributions to be recorded. Let's kick it off here with a round-table discussion as we see the prospects of this crop in the Western Hemisphere from the standpoint of either oilseed, specialty, confectionery or bird food trade.

Individual comment: As I see it from the crushing standpoint, the limiting factors are birds, diseases and insects. Probably they would be in reverse order so far as importance in this area. If we could overcome those three things we would have a competitive crop with grain sorghum. It would fit in a rotation remarkably well.

Smith: I am a plant breeder, but our concern is not so much whether or not the crop can be changed for yield increase, disease control and insect control. Our thoughts center around vegetable oil prices in this country in the foreseeable future. You will be competing principally with corn oil, secondly with safflower oil and right today we are faced with 10¢ per pound of the highly unsaturated vegetable oils. This means that you must have high levels of oil per unit of seed in order to make it economically sound. You cannot pay the grower high enough price to make it such that he can stay with it. When you start getting oil content in the range of 40 to 45%, this changes the complexion of sunflowers as the source of oil. But by the same token we would hope that somebody does something on the marketing aspect of the oil before we go too far. We have a classic example by what happened in the last 36 months on safflower; when people get enthusiastic, get a commodity produced, get it crushed and begin to fill up tanks, the first thing you know somebody has to sell out. The farmer is the man who loses in the end. This is the sort of thing that we don't ever want to see come to pass.

Spears: From the standpoint of plant breeding, if things went along well with farmers following proper practices and having reasonably favorable growing conditions, what oil content might a farmer obtain with a hybrid or variety in the next five-year period?

Smith: There are others here who could answer that better than I can. Right at the moment I was asked where is our principal area of interest. Our principal interest is in North Dakota and Montana where we have a processing plant that we have been trying to operate with safflower. We have had some success, but we have also had some unsuccessful years. We think that if one could get an oil content in that area in the range of 40 to 44% acreage would be grown. By the same token it is going to depend upon what happens to government programs such as in wheat. Many areas of this country will go back to the crops most economical for them to grow if there are no controls. In much of that northern country they go right back to wheat.

Spears: Do you think it is feasible to develop a variety or hybrid adapted to the Minnesota-Dakota areas that would give 40 to 44% oil?

Kinman: This would also apply to southern Manitoba. This oil percentage already exists there in the Peredovik variety.

Individual comment: On the basis of Russian literature, there are probably earlier varieties equivalent in oil content but may be a little lower yielding. Would you hazard to guess on what return the Montana grower would want to make the crop competitive with other crops?

Smith: No, I don't think I could make this projection for the very simple reason that normally for an area to get into production you need a plus factor above what he can get out of the crop he is presently growing. There is difficulty to get started in the first place. Once you get started and get sufficient acreage then you get all kinds of people coming in. This is what happened to safflower. After some concern gets a new crop started after several years of plugging away at it, all of a sudden everybody wants to get into the act and then you have a problem. I believe there are people here who have seen this in castorbeans. You keep driving and all of a sudden everybody seems to get interested and the first thing you know you have far more than you need. As I see the bird seed trade, it is very easy to fill the market. Any oilseed crop in this country has a relationship to soybeans. Have you looked at soybean prices today? You can buy them cheaper than you could in the depression years.

Spears: Dr. Putt, you mentioned you have the varieties now that will give high oil content. Do you think that you have sufficient disease resistance in them for extensive plantings?

Putt: Yes, but I think there is a risk from rust in Manitoba. When you get out into Saskatchewan and Alberta I don't think that the hazard of rust is as great. The other major disease in my opinion is Verticillium. The Russian varieties, at least under our tests at Morden so far, have definitely more tolerance to Verticillium than than the hybrids have had.

Kinman: They have some tolerance to rust under our conditions. Is that true in Canada?

Putt: Well, yes, they would have some tolerance.

Kinman: I mean they are much better than Mennonite.

Putt: No, I would not say they are.

Kinman: Under your conditions, no? Under our conditions here they never grade as high as the most susceptible material.

Putt: Another thing I want to say is in the 15 years or more that we have been growing the crop in Manitoba, the gross return per acre has been approximately comparable to the gross return that the farmers are getting from wheat. Now this is, of course, with lower oil varieties. With the introduction of these Russian varieties, we may have this plus factor that was mentioned.

Individual comment: Your growers are working against lower wheat prices than we are, is that right?

Putt: That is right, so there may be a distinct increase in sunflower acreage in the next few years. I think that for our area sunflowers offer the advantage in comparison with other potential row crops. As I have said many time, and there is no reason to change my mind, that if the Western Canadian grain farmer is going to use row cropping in his operation it will be the sunflower crop.

Kinman: There isn't any particular reason why, given a little time and facilities, we can't have hybrids which are at least as high in oil as the best Russian varieties plus disease resistance, plus hybrid vigor. This would increase and stabilize acre-yields.

Individual comment: Another item of importance for Canadian conditions is a week earlier maturity (than we now have) would make a variety much more attractive to our growing conditions.

Johnson: I have a question in terms of marketing surveys. East of the Red River Valley where you get into wooded areas of Minnesota, we do have some production increase. In fact, we have representatives here from the Gonvick area which was put in through the area redevelopment program. Further east than that individuals have become interested in sunflowers as a possible crop because in that area they have no cash crop. They were looking in terms of a research grant from area redevelopment administrators and contacted our

experiment stations in terms of what it would take. We told them \$150,000. For such a grant there has to be a market potential survey. This was discussed and they also went to our experiment station directors who turned to our agricultural economics department who volunteered to make this survey. Such a survey was made. The preliminary report of the survey came to us in February. A copy was handed to me and I was asked to read it. I did. I was then asked what do you think? I said, "I am very disappointed." The survey did not tell anything we did not already know. It could have been done over the telephone in one afternoon. They said, "As sunflowers are, it will not compete with soybeans commercially as an oil crop." I said that we knew this. There was no indication in terms of what our potential may be or any price differential for oil. It said that we are in an oil surplus, which we already knew. I went down and talked to the individual who made the survey. He said, "By tossing in factors such as a higher oil percentage and increased yield potential, this does change the picture completely."

Smith: Many people will have to remember in regard to this that many of our vegetable oils in this country are by-products. In other words, soybean oil is a by-product to the feed industry. And so, we must never forget that price can go lower yet in the market place. When you see 22¢ margarine or even 16¢ margarine and you buy oil at about 8¢, the processor is in trouble within that margin. You have to have a lot of oil per ton of seed before you can make the economics of this thing work out.

Johnson: There are two things I see directly on this point: One is presently they are paying more per bushel for soybeans for the oil than they are for the meal. The oil brings more return than the meal so the oil is more important. Secondly, the sunflower meal is desirable and fully comparable to soybean meal or essentially comparable. Thirdly, I think if we produce a cheaper volume per acre the farmer can still make an adequate profit, and we could possibly undersell soybean oil. There is one consideration that has to be brought up. I think someone from outside Canada or the United States might emphasize this point. My interpretation is that when you talk about sunflower oil going into margarine, which it can do, I think you are talking about a Cadillac being used as a Jeep. I don't know if you have the same demand in the U.S. as they have elsewhere in the America's and in Europe but sunflower is an edible oil which competes not with margarine, but competes with olive oil. It is a very high quality salad type oil. I don't know how big the market is, but in that class cottonseed oil, corn oil, etc. have to be given much more processing than sunflower oil to get it to an acceptable level. Chemical characteristics make it better for that particular use. Now, is this a potential market? Talking always of sunflowers as an oilseed crop, this is the market that makes it important in eastern Europe, it makes it important in Latin-America.

Smith: As has been said time and again, the whole economic picture is going to govern the situation and, with the present outlook for surplus oil, you get a surplus and a broken market. It does not take much surplus to do it. Then, with the protein market facing a battle to the finish with urea (and there is no doubt about this), urea is going to hammer down the price of all protein just as soybean oil is hammering down the price of all oil, regardless of what they are. We have a highly competitive situation that has to be looked at very thoroughly. However, I believe as this gentleman over here that sunflowers can compete if we could get yield and quality up.

Spears: You are talking about competing from the standpoint of farm production, but what about the price in the markets? Are you saying that sunflower oil is going to come to a level closely approaching soybean oil?

Smith: That is right. In other words, soybean is going to be in relation. There is no doubt that sunflower oil will outsell to a degree soybean or cottonseed oil or other vegetable oil because of its quality, but at the same time it is going to be low in price because of your big supply of soybean.

Spears: It is not outselling if it is not bringing more per pound.

Kinman: Even if it just sells first this is the advantage.

Spears: Well, now back to California's question. You mention economics of this thing or the price. What is being said here seems to be that the sunflower, though it may be superior in oil quality, may have no advantage in actual price per pound. I understand you are saying that if production per acre gets high enough and that oil content is raised you may have a plus factor even though you are drawing the same price per pound for the sunflower. That brings it back to the plant breeder and to the agronomic practices required to get yield and oil content up. Is this right? Is this where the answer lies in the success of the sunflower?

Kinman: Peter can answer that better than anyone else I believe.

Bergen: For sometime I felt the need for discussion about different varieties, particularly the new varieties. The importance of the quality, or the state of oil content, or the case of bird seed appears to be overlooked. I think that should perhaps come over yield.

Spears: What you are adding then is another factor that will be answered by the breeder or on the farm. When you come to the market you must have sufficient oil content, quality of protein or oil and the pounds to make it competitive with another crop, whatever that crop is.

Individual comment: Aren't you saying, Peter, that the type of seed we grow would have to have multiple uses. If you have all these possibilities it would be that much better.

Individual comment: That would be desirable. In Tulane, North Dakota, last fall we had several farmers tell us that certain varieties were suitable only for bird seed. The people who had been in the business for some time would much rather plant a variety that could be used for two purposes - for the oil seed and bird seed. These people are growing the variety that can be used solely for bird feed. They are flooding the market with bird feed and what are we going to do with the small seed in the Mennonite.

Spears: Do you think it possible to have a variety within five years that will either have the yield, the appearance, the quality of the seed or the oil content to the extent that we can afford to put on insecticide sprays required to control insects in situations or areas where the insects are in damaging numbers? Are we going to have a crop that we can follow through with an insecticidal program as might be required?

Kinman: I think, I probably had more disappointing experiences with insects than anyone here, except perhaps some of the fellows in California and you seem to have your problem pretty well under control.

Spears: I want to hear then, Murray, how they got it under control?

Grissom: Of course, in California we got it under control by insecticides. Generally the sunflower head moth is the main cultivated insect problem. We have timely spray applications of substances such as parathion or Sevin. Previously, we used DDT but the residue problem became such a headache. We can get by very nicely with 5% or less crop damage with two applications.

Kinman: Their problem, as I saw it in California, doesn't compare with the problem in most of Texas and perhaps Oklahoma, Kansas, and Nebraska. I have been in the field with Dr. Grissom and Northrup, King fieldmen and with other California people. I have heard them remark, "Well, it is here. You had better have that farmer get the spray contractor in here." I looked and looked and I didn't see any real damage, but it was enough to concern them. Under those same conditions at the same stage of growth without prior control in my experience, in some locations at least here in Texas, there would have already been complete destruction of the crop.

Grissom: Well, I can give you a specific example (what was it five years or so ago, Ray?). We grew sunflowers on the High Plains of west Texas with the same two timely applications of insecticide with very good results until rust took us out of the picture.

Rust took us out the third year. Some fields went as high as 2400 pounds per acre. It was good enough that farmers wanted to plant again. With the same spray control program used in California, the thing rocked along until rust took us completely out of the picture because we were using rust susceptible material. Without the rust I venture to guess that Northrup, King would still be growing sunflowers on the High Plains of west Texas.

Spears: Do we have hybrids with rust resistance that you could grow there now?

Grissom: No, not the large-seeded type. We are introducing this rust resistance. We have plenty of sources of the large-seeded, but we don't have a hybrid ready yet to go back. As soon as we can get one, we will go back on the High Plains of west Texas.

Spears: When are you going to be back?

Grissom: I would say four years, three or four.

Spears: When you said two applications, what is your key to the first and second applications?

Grissom: Well, of course, I am not familiar enough to know, but the application time comes when the head first starts to form and then they watch it very closely. We had a fieldman in west Texas who did this. He came from California and had been growing sunflowers for 15 years out there. He watched this thing, and he could control it very nicely with very good quality of sunflower seed coming out of west Texas.

Kinman: Yes, and we have a hybrid right now that will be suitable for the bird seed trade, which could be grown in west Texas with this control and possibly with only one application of insecticide. It is an F_1 hybrid, and it flowers much more uniformly than do the open-pollinated varieties.

Grissom: If Dr. Knowles were here from California, he would say that he has never been able to substantiate the fact that any insecticidal treatment has been effective. Deryl will argue with you wholeheartedly about this, but I am of the opinion that in some cases where we got pretty good control, we would not have infestation in any case. I have seen some fields where we have had as many as three applications where we were unable to control it and even using DDT.

Spears: Are these controlled studies with checks and so forth you are speaking of?

Grissom: The Department of Entomology in California has an official booklet that says no insecticidal spray has yet proved effective, including DDT, which is a good deal stronger than anything we are able to use.

Individual comment: Has anyone here tested the so-called "armored varieties?"

Kinman: Yes.

Individual comment: They don't work here?

Kinman: Absolutely, without any value whatsoever. We were intrigued with this idea. Once we tested our nursery which included the Russian material, and we also have a lot of the armored layer in our own material, particularly the material that traces to the Texas Wild. This is where they got the armored layer in the first place or in some North American Wild. Here at College Station some years we could get by without control of the Homoeosoma. We have a relatively small population of native sunflower. Our troubles here are just as often the salt marsh caterpillar which may defoliate the plants. We grew a complete repeat of our nursery and yield test, plus additional large scale plots at McGregor where wild sunflowers are not simply roadside or grain field weed but a serious row crop weed. On a certain day in early June I visited these plots at McGregor, and there was no insect damage. The moths were flying by the billions in this nursery. At that time I didn't recognize the moth. This was in 1962. I had never actually seen the moth. I had seen the larva plenty of times. I had to culture the moth on heads before I recognized it and got pictures of it. Anyway, at this date in early June the moths were flying by the billions in this nursery. This was at the time of first flowering of the local wild sunflower population. I used to think that the first crop of moth emerged at the time of the first wild sunflower bloom. I thought nature had timed it this way. (I am not sure of this anymore because of what happened this spring.) But, there was no damage at all. I came back 14 days later and the entire heads were completely destroyed. This included the armored material as well. Homoeosoma electellum is not bothered by the armored layer in any respect whatsoever.

Individual comment: What stage was the plot material when the insect occurred?

Kinman: At all stages, this was a wide collection that I had from very early to very late. Now the only plants that matured any viable seed at all were those which already had hard seed when moths began to fly and those which did not flower until two weeks later when we had probably a break in the cycle of moth flight.

Sackston: One of the things that the Russians told me was that time of planting was significant. If you took even the highly resistant varieties to the European Homoeosoma and put them in critically late (maybe very much later would have been all right again - but if you put them in at the critically wrong time) the armored layer would not have been sufficiently developed at the time the insect started to infest and you no longer had protection. The seed has to be sufficiently advanced when the insect was in the right stage.

Kinman: You must remember that the European Homoeosoma does a different type of damage than the American Homoeosoma. The American type of Homoeosoma completely destroys the entire head, the European Homoeosoma drills into individual seed. The McGregor sunflower study was planted at the normal corn planting time. One more comment - the American Homoeosoma apparently has alternate hosts in addition to sunflowers. We know that it attacks safflower. I suspect that it also attacks some other native early flowering composite in this particular area. I had never previously seen Homoeosoma damage on sunflower before about June 15 at this location. This spring we went to transplanting from the greenhouse. Plants were 12 inches high at the same date that we were seeding in the field. This was to give us time isolation as well as space isolation. We had complete destruction of the very earliest of these transplants early in May before any wild sunflowers had even thought about blooming in this area.

Spears: I have a question to ask - first to Murray and Eric. Do you think it reasonable to expect by the use of disease resistant hybrids and good farmer practices a yield of 3000 pounds per acre?

Kinman: We have had such yields experimental, so it is not an impossible goal. But in view of our experience with other crops it is probably not as practicable.

Putt: I don't see it in the next 5 or 10 years - maybe the next 25 years. It is not an impossibility - 15 years at a minimum.

Kinman: I do say that under favorable conditions 2000 pounds is not an impossibility within 10 years. This would be under the most favorable conditions in any particular area where sunflower might be grown. This would be 100 bushels corn, 2 bales cotton, 4000-5000 pounds sorghum areas, etc.

Johnson: I would say this that probably within 10 years it will be possible for some of your very best growers to get 3000 pound yields per acre.

Spears: Mr. Luciano, in Argentina, how do you see the prospects?

Luciano: Well, I have seen a hybrid yield 1800 pounds. I think that if we can use a hybrid 3000 pounds can be produced under ideal conditions.

Dahlgren: We have the farmers right now who will average 1700 pounds with Mennonite using good farm practices on good land.

Kinman: Those same farmers in 10 years, if the research programs are effective, should grow between 2000 and 3000 pounds per acre quite regularly.

Dahlgren: We could spray, but we don't even dare bring the spray rig out in the yard because pure Food and Drug sits on our doorsteps 12 months out of the year. But you can see what these people have done with sugar beets on their average yield.

Johnson: If we could maintain or reach a 45% oil and if the processor could cover processing, etc. by the sale of the meal, by my calculation we could reach these goals. These are tangibles I seek as goals of a breeding program. Where you return \$90 per acre to the farmer, this would compete with sugar beet acreage in Minnesota, and it could compete with 7.5¢ oil in our market.

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