DISCUSSION 6

Dr. Martin :

I would like to ask Dr. Royes what has become of the collection of the **D. alata** cultivars ? Is it still in tact and do you have any plans to do anything further with it ?

Dr. Royes :

You will see all of them tomorrow afternoon in the field.

Dr. Yen :

Mr. Chairman, I would just like to ask Dr. Royes about his concept of tuberisation. While he has made quite a strong case about selection against — I think he called it 'Mother Nature' — in that the tuberisation process goes on for some considerable time, I wonder whether this is really valid. I think also, we ought to look at the distribution of the plants in a pan-tropic way.

D. alata, the greater yam, is really one of the basic crop plants of agriculture in many parts of the Pacific. In the types of agricultural systems that are there, the swamp people of Southern island of what was Dutch New Guinea are forced to phase their agricultural operation with the seasons. One of the plants identified as **D. aculeata** (I suspect it to be **D. esculenta**) and the other one is **D. alata.** Now this has to be harvested in reasonable time because when the floods come its impossible to cultivate any more. Now you might say well they are satisfied with very low yield but I do not think this is the case. If you see the photographs in Serpenti's 'Cultivators of the Swamps' you will see some large tubers. I wonder, then, whether it is justified to call 'chicken' at this stage.

Mr. Gooding :

I would like to make one or two comments on Dr. Royes' paper. First of all I noticed the yields obtained in Trinidad are rather on the low side. The average yield for yam in Barbados is about 5 tons and if you do not get up in the 6 or 7 tons you are not really in business. I was rather surprised to see yields running around 2 and 3 tons on the average especially in Trinidad where it is the custom to stake yams and everybody coming from Trinidad tells us in Barbados that you ought to stake yams — we do not stake them — and we will get much higher yields. Survival at 95% is again a normal thing in our commercial plantations. We don't get these big losses except on rather rare occasions when we do have severe attacks of **Colletotricum.** This has only been noticed by planters in recent years. We find that if we spot it in time we can spray the field down with a copper fungicide and usually control it. Regarding the initiation of tuberisation I would like to comment on that. I will be mentioning this in my paper on Wednesday so I'll let is pass at the moment.

But another point. I think somewhere along the line Dr. Royes mentioned about the leaf area of yams. We have in fact measured this on commercial plantations. We have measured single plants lying on the ground not staked with leaf area totalling about 75 sq. feet, 600 leaves and upwards per plant and total stem lengths measuring a total length of 400 feet. A single yam plant of **D. alata** can be a very considerable plant indeed and we have measured tubers weighing up to twenty pounds but we do not like them at that size but just as a matter of interest for the meeting this is the kind of thing that does happen even in commercial practice.

Dr. Royes :

I just mentioned — well we have made it a practice of trying not to complicate any of these varietal trials with any other factors. We invariably got hammered with disease and yields were all low. We do not fertilize or anything of this nature and when you see the soil at the Field Station you will know what we are up against. The second case is that Barbados is a far drier island. If the diseases get hold of cultivation then do not waste your money on sprays.

Dr. Coursey :

The simple sore points I would like to mention on Dr. Royes' paper are first of all the question of leaf area index or leaf area whether there may be gain or loss of foliage. Some experiments on pruning of **D. rotundata** were carried out in Nigeria some years ago. As far as I know they were not recorded anywhere but I did see the rough results which indicated that removal of foliage tended to diminish yield. There was no advantage whatsoever in pruning. Now I would like to discuss very briefly a point in connection with **D. alata.** It is of course Asiatic in origin and the number of cultivars existing in Asia, Indonesia and the Pacific is far greater than the number existing in the Caribbean. When we consider the history of **D. alata** in the Caribbean we must remember that it came here in slave ships. The planting material which was first introduced from Asia and then from the Portuguese plantations in Tortomay and West Africa had been selected for their storage quality. You probably have varieties which are very good in storage but may not be so good in other respects. Weight of individual tubers of up to a cwt. can be obtained with some of the Asiatic forms without all that much difficulty. Well perhaps that is a slight exaggeration but without any great difficulty certainly 20 or 30 lbs is in no way exceptional. Similarly of course there are hundreds or, I would like to say, thousands of cultivars of **D. rotundata** and **D. cayanensis** in Africa which have never been recorded at all. It thus seems as though there is some potential there which might be better producing than some of the varieties here. Also I just mentioned within the species **D. rotundata** there is enormous variation in time of initiation of tuberisation. There has been no systematic work done on this but one knows from experience that adaptation of the same species to a wide range of dry season ranging from only two or three months in the south to nearly six months in the north.

Dr. Royes :

I hate to seem callous but I have looked upon these trials that I have done as a sort of terminal. I mean we now say that one of the best ones we have now is Oriental. We have not been able to do any breeding as I mentioned, because we do not get any seed except in **D. trifida.** Now we are not short of work and I feel that it may take in the region of ten years to get some reasonable results from breeding as opposed to selection in **D. alata.** I think we are going to try with **D. trifida** because personally I would much rather eat **D. trifida** than **D. alata** and I think West Indians are very fussy people and they are not going to eat **D. alata** if they can get **D. trifida,** so we may as well not breed it.

Dr. Coursey :

I'll just come back for one minute on this. I am very much inclined to agree with Dr. Royes on this point about **D. trifida,** but this does seem a point to mention— that there is a great need for plant breeding work to be done on any sort of yam. Whether this is the appropriate place to do it I can't say but somebody ought to be doing some and nobody else is.

Dr. Martin :

I would like to make a few comments on the breeding aspects of yams. It is true that this is one of the tropical root crops that has been neglected and there are some very good reasons for it. Most of the cultivars of the cultivated yams, with the exception of **D. trifida** are polyploid series with very large ranges in chromosome number. In addition, it is very hard to get them to come into flower and when you get them to flower it is hard to cross them. So of all the crops discussed today this is one of the most difficult to breed by conventional methods. On the other hand, there are so many different cultivars throughout the world and so little is known of them that probably a tremendous amount of progress can be made by these commendable efforts of gathering them into collections and trying them out.