

Appendix 6

Report on Introduction of Plug Cell Tray System to MoA Nurseries - Jordan

During the Jan-Feb 2014 mission, 4 MoA Nurseries were visited with a plan to:

1. View seedling production operations for the upcoming sowing season
2. Conduct a review of general nursery operations
3. Introduce the Plug Cell Tray system by means of a small experiment using cell trays from Australia planted with various sources of *Atriplex halimus* and *Artemisia herba-alba*.

The nurseries visited were Khaldiyyah, Deir Alla, Al Basah and Ghor al Safi.

The seedling production systems at Khaldiyyah, Deir Alla and Al Basah have already been covered in earlier reports (Appendix 1 & 2). Ghor Al Safi was visited on Wednesday 5th of February. Here we met Mr Nidal Hishoosh who explained that 88,000 seedlings out of the total of 100,000 had been sown and that they were waiting on soil before finishing the final 12,000. As with Deir Alla and Al Basha nurseries, there was a distinct group which was more mature than the rest and this corresponds to the bags which were sown on the 2nd of January. There were about 16,000 bags in this category but there was a large number with no plants and so the estimated quantity of living seedlings would be around 11,000. This number could be restored to the full amount if transplanting was done into the empty bags using multiples from the other bags. A demonstration was made as to how to do this and this task was to be taken on by the staff in the next few days.

As with the other nurseries, all bags required thinning to one single plant. This was also demonstrated and taken on as a job to begin the following day.



Atriplex halimus ssp. halimus 1

An interesting observation made while visiting all 4 nurseries was the apparent existence of 2 distinct ecotypes of *Atriplex halimus* within the seedlings being grown. This was first noticed at Khaldiyyah where the large group which was trimmed and eventually sent out to Ossagi and Bandan for re-planting, was predominantly the small leafed fine type. Just adjacent to these however, were some much younger seedlings which appeared to be the more robust, bigger leaf

type. According to Dr Gus Gintzburger, a very experienced botanist in the region, the finer small leaf type is the preferred *Atriplex halimus ssp. Schweinfurthii* usually occurring in arid environments. The larger leaf type is *Atriplex halimus ssp. halimus* which does not have the same drought tolerance as

the former one mentioned. In 1992 Henri Le Houerou wrote: “The greater drought tolerance of *ssp. schweinfurthii* populations may be related to the more woody nature of their stems and lower leaf to stem ratios” Both of these types were observed in mature plants growing on the fenceline at Khaldiyyah. (see



Atriplex halimus schweinfurthii 2

photos)

This variable leaf size phenomenon was noted in the seedlings being grown at the Jordan Valley nurseries as well. As the plants are still very young it is hard to be definitive, but initial observations would indicate that the smaller leaf type *Atriplex halimus ssp schweinfurthii* was predominant at Deir Alla nursery, while the larger leaf *Atriplex halimus ssp. halimus* was the most common one at both Al Basah and Ghor al Safi. The origins of the seed used in planting was either from Khaldiyya or from Shobak.



Large leaf *Atriplex* plants at Ghor-Al-Safi 1 (likely *Atriplex halimus ssp. halimus*)

It will be worth monitoring the seedlings to determine if indeed the ones displaying larger leaf characters at present do evolve into the less desirable *A. halimus ssp. halimus* type as these will not have same drought tolerance as

the finer *A. halimus ssp. schweinfurthii*. Indeed it may be that these types are not planted into the field. For future seed collection expeditions, I suggest that seed always come from very arid areas similar to where the plantings are proposed. (I have previously suggested that the Shaummary Wildlife Park would be an excellent seed source area).

Twenty five cell trays which are the basis of the Australian system of shrub propagation were donated to the BRP by the 2 Australian nurseries. These comprise 12 of the 72 cell 45cc cell trays, 12 of the 81 cell 80cc cell trays and 1 of the 512 cell 7cc trays. A media mix of 50% german peatmoss and 50% perlite was made and all trays filled with the mixture. 6 cell trays (3 large and 3 small) were sown at each of the 4 nurseries (except at Khaldiyya the extra 512 cell tray was also sown). Into one large and one small cell tray type, seedlings were transplanted. Into the other 4 trays, a combination of *Atriplex halimus* seed from all of the various seed sources was sown as well as a small amount of *Artemisia herba-alba* seed which had been collected from Ossaghi. It is hoped that by sowing *Atriplex* seed from the different sources side by side, we may gain an insight into the issue of a subspecies type problem. A demonstration was

conducted at each nursery with the person designated to care for the trays as to the weekly fertilizer program needed for these trays. The fertilizer had been pre-weighed and a watering can supplied for the exercise. A list of overall care instructions were also issued (see appendix 5) which had been translated by Mrs. Mervat into Arabic.

Engineer Mervat will hopefully visit all nursery sites weekly and keep a close check on the progress of not only the cell tray experiments, but the progress of the bulk seedlings in bags as well. She will also be purchasing some complete soluble fertilizer to give to the individual nurseries to apply 3 weekly to all nursery bags. This should improve the growth and the health of the seedlings before transplantation.

The introduction of the cell trays will hopefully be the first step in a new direction of a more efficient and much more logistically effective means of producing seedlings for the BRP-CAP.



Cell Tray Experiment at Deir Alla 1