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IMPRESSIONS OF THE NUBARIA "NEW LANDS" AREA PD-AAN-708

According to the oral report[1/] by by Dr. N. El-Mowelhi, Egypt has about 2,000,000 feddans of sandy calcareous soils most of which can likely be brought under production when appropriate soil management and reclamation are instituted. Probably widely varying levels of reclamation and management would be required. Maize production is hampered by calcareous and salinity problems where sorghum production may be possible.

A portion of this area is the Nubaria new lands area on the western edge of the Delta encompassing as much as a half million feddans. The Nubaria canal supplies water to an area near the Nubaria research station where the soils are much finer texture than the nearby commercial development areas such as the Behera Company project which we visited. The Behera Co. project has been implemented on sandy calcareous soils which apparently have not been extensively tested for cereal production. Corn and sorghum grow well on the Nubaria station but performance appears less well understood under the more marginal areas typical of the Behera Co. project. However, two October, 1980, alfalfa plantings looked fairly good, sunflowers were not impressive, and an oat field looked just fair. Planting data was not known and a desert sand storm had severely lacerated the small plants. Maize and sorghum production appears quite possible in the area but many questions will likely have to be answered to assure economic production with minimal water requirement. The following outline is by no means comprehensive but relates to some of the questions requiring attention. Simple cereal trials in the absence of a fairly extensive farming systems evaluation are not likely to be very useful in terms of putting the area into production on an economic basis. The four general areas of importance consider an integrated approach.

1. Cereal choice - Sorghum appears to be more tolerant to salinity and drought than maize and should be considered. However, the bird problem may not permit its use unless a very large acreage is tried. Therefore, a comparison of corn and sorghum is in order.

   a. Maize

      1) test 2 or 3 hybrids based on currently available data
      2) select 6 hybrids for test based on other data

   b. Sorghum

      1) select 20 genotypes for observation
      2) use 3 corn and 3 sorghums for yield trials at 2 water levels

1/ National Maize and Sorghum Annual Training Meeting held Febr. 24-26, 1981 Agricultural Research Center Library Conference Room, Giza, Cairo, Egypt.

3) bird resistance observations

a) try high tannin brown sorghums
b) test recurved peduncle durras
c) harvest premature high moisture grain and test for the local poultry industry.

c. Pearl millet

Use for border row observations since its high quality protein may be desirable for poultry. Also its water requirement is lower than for sorghum.

d. Sorghum and corn fodder

1) high moisture grain taken as in (1b) above to reduce bird losses influences fodder management since the stalk is green on both corn and sorghum.

a) machine harvest of threshed or shelled grain could mutilate much fodder
b) hand harvested whole panicles or machine topped panicles could be stored in an oxygen free environments (glass lined silos or inexpensive plastic silage bags) for livestock feed.

2) fodder management of topped grain sorghum

a) green stalks can accumulate appreciable amounts of simple carbohydrates when the panicle is removed. Greater gains would be expected from sorghum (perennial growth habit) than corn (annual)
b) evaluate fodder value for livestock or alcohol production
c) sudan-sorghum crosses which give several cuttings per year could be tried to supply ruminants.

2. Salt tolerance

This is likely to be a problem sooner or later in view of the salt content of the soils and the irrigation water. Problems may appear in 2 years, 10 years, 40 years or more. Therefore, a selection program should be instituted now in anticipation of future requirements. A nursery spot on the Nubaria station is available to begin this work immediately.

3. Farming systems

a. Mechanized low pressure or drip systems should be investigated regarding utility to

1) reduce water requirement by reducing evaporation
2) absolute water control reduces drainage problems
3) control of water input and drainage reduces salt problems

b. The mechanized linear-move low pressure drip system in (3a) is normally used in a large commercial venture but is quite adaptable to small farmer use. Several cooperating farmers could utilize small sections covered by a single linear move system capable of handling 150 to 300 feddans. Systems visualized are similar to center pivot systems currently on the Behara project except they move in a straight line.

c. Rotations

1) Winter cropping should be considered. Therefore wheat (W) and winter legumes (V - hairy vetch, etc.) should be considered. Grain legumes also may have a place in reducing the commercial nitrogen requirement for cereals. Consider the following 3-year rotations:

sorghum (corn) - wheat - sorghum (corn)
" - wheat (plus vetch) - sorghum (corn)
" - " - soybeans - sorgum (corn)
" - soybeans - sorghum (corn)
incorporate alfalfa into longer term rotations

2) water levels

a) water use efficiency in corn vs sorghum
b) evaluate 2 or 3 water levels on both
c) monitor timing and water level effects on salt levels and soil properties

3) tillage

a) conventional
b) minimal subtillage
c) zero tillage to minimize evaporation losses and stablize the sandy soils. Mulched soils will likely require breeding for cool temperature root growth

4) economic evaluation when workable systems surface from the experimental efforts.

4. Experimental arrangements.

a. Sprinkler the first year to get relative production potential estimates for corn and sorghum. Gravity could be used in the absence of sprinklers.

b. Long term

1) mechanized low pressure (3b) for both large and small scale farmer use.
2) compare conventional drip approaches
3) gravity seems unlikely in the sands unless small fields from pipe fed main laterals are used.