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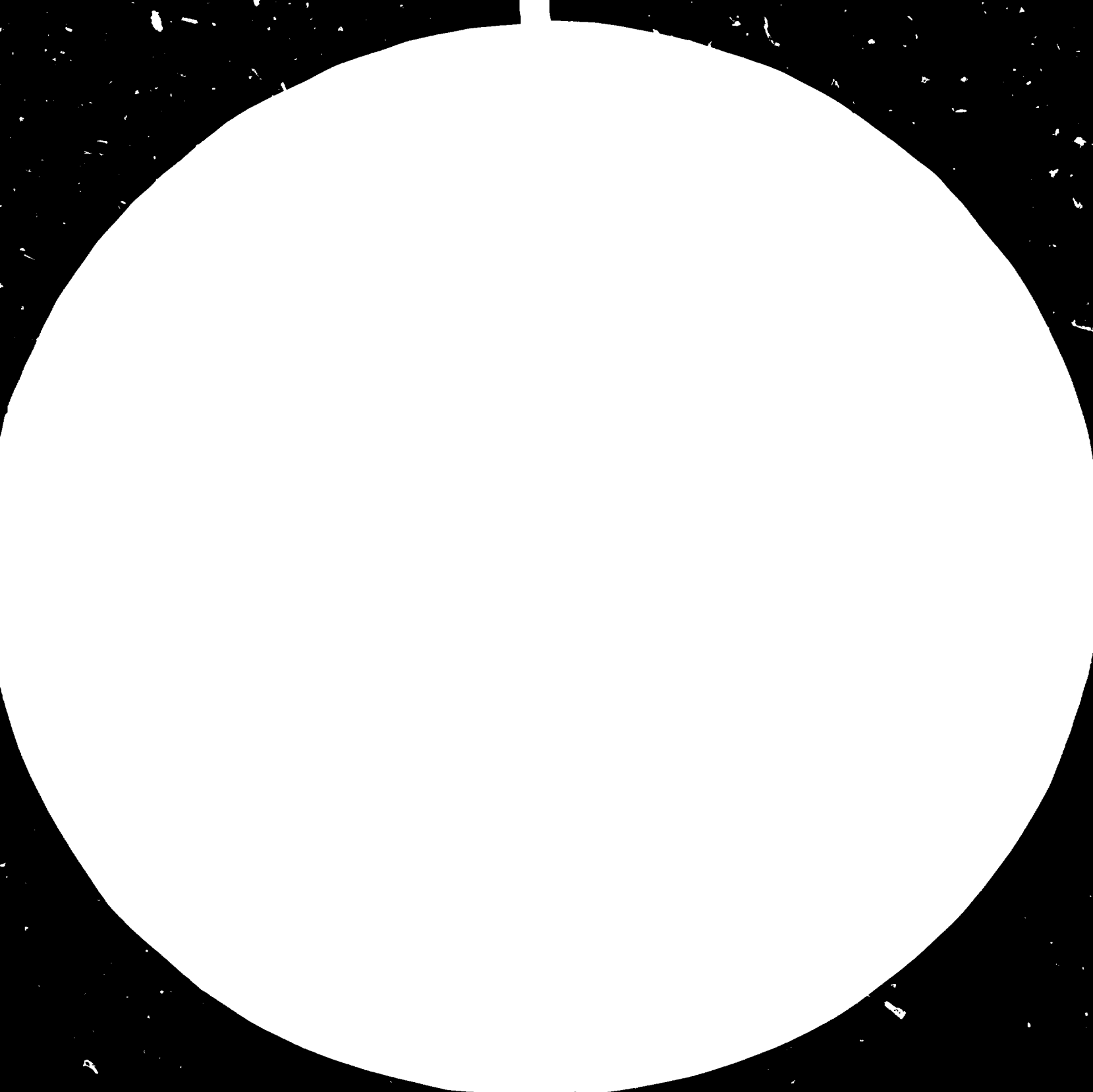

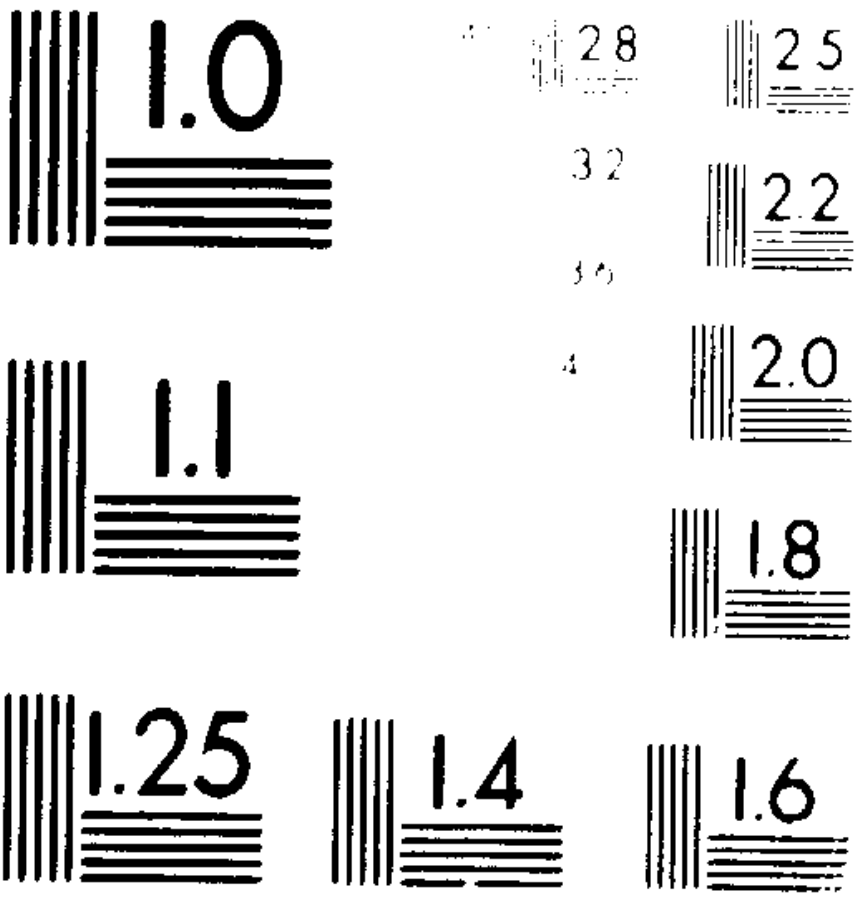

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Report on the Regional Symposium for Plastics in Agriculture
Alexandria 27 Oct. till 1 Nov. 1984

by Peter Widmoser

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1. Objectives of the mission

- participate in the symposium
- conduct a lecture on introduction of PVC pipes to improve drainage capability and to overcome problems of drainage
- advise and assist in evaluation of results through participating in the Recommendation Committee
- initiate side talks with African and Egyptian delegates to discuss problems and recommend solutions

2. Activities of the expert

2.1 Contract with delegates

Discussions with a number of delegates give the following impressions:

In the Mediterranean countries (no delegate from Lybie) subsurface drainage schemes are already in work or are in the planning phase. Plastic drainage pipes are partly in use beside concrete pipes. Drainage ist only done in connection with water logging or soil salinity problems under irrigation. Also stagnant water appears to become a problem (intense cultivation?). The largest areas already supplied with subsurface drainage systems apparently exist in the Nile delta. There one is also aware of and quite interested in the application of drainage filters.

In the countries of the humid tropics reclamation of swamp areas or flooded (coastal) plains seems only to take place locally so far, but projects of this kind are beeing discussed. As a first step, open ditch drainage is installed.

Subsurface drainage appears to be too costly.

2.2 A number of questions regarding drainage were answered to the Chinese observers.

3. Special notes

3.1 The advantage of using plastic membranes to avoid percolation losses in small reservoirs is obvious. New efforts will be required to reduce evaporation losses from reservoirs, which can be in the order of 10 mm/day (i.e. 100 m^3 per hectar and day).

3.2 The use of plastic nets to protect the embankments and slopes of ditches against erosion, as shown by an Egyptian enterprise is of great interest. More experience should be collected and finally be summarized (manual) as to their proper installation. Durability checks should be made, this particularly with gabbions using plastic nets.

3.3 Use of corrugated plastic drainage pipes may be recommended also in soil erosion control in hilly areas of humid tropical climate according to experiences in the Alpine region of central Europe.

3.4 Destruction of burried plastic pipes by rodents was mentioned to be a problem in Egypt. No such observations were made by the author after nearly 20 years of observations in central Europe. FDC should collect material in this respect.

3.5 Obviously the application of plastic materials in the field of agriculture might also include the field of rural domestic water supply (sometimes even administered by the Ministry of Agriculture). PE and too a less extent also PVC pipes are the technical preconditions in the effort of several countries (e.g. Ethiopa, Tanzania, Came-

roon) to meet the basic demands of domestic water supply also in remote villages. Special consideration might be given to the use of plastic material in simple water treatment installations like slow sand filters or even (partly) replacing them.

3.6 Testing guide lines as already in many countries) have to be applied to the products of plastic materials (pipes, nets) whenever used under harsh field conditions in water management projects. However, adjustments may be necessary for arid, semiarid and humid tropical climates soils and working practises in Africa. To this end field observations should be collected systematically (by PDC).

Common Dimensions for Plastic Drainage Pipes (DIN 1187)

Smooth Pipes

Diameter nominal	Diameter outer mm	Diameter inner mm	Wall thickness mm	Tolerance mm	Weight kg/m
50	50	48	1.0	+ 0.5	0.216
63	63	60	1.2	+ 0.6	0.353
75	75	72	1.5	+ 0.7	0.485

further nominal diameters: 90 , 110 , 125 , 140 , 160

Corrugated Pipes

Diameter nominal	Diameter outer mm	Diameter inner mm	Wall* thickness mm	Tolerance mm	Weight kg/m
50	50.5	43.o9	0.6	- 1.5	0.165
65	65.5	58.0	0.7	- 1.5	0.235
80	8o.5	71.5	0.8	- 1.5	0.320

further nominal diameters: 100 , 125 , 16o , 200

*not according to DIN 1187

Test for Plastic Drain Pipes

1. The pipes must withstand handling, transportation and laying
   - deformation test
   - impact test
   - elasticity test

2. The pipes must be inert against aggressive soil and water chemicals (e.g. gypsum), bacteria and against radiation (ultraviolet)
   - chemicals tests
   - physical tests

3. The pipes must function hydraulically
   - smooth pipes walls (also for corrugated pipes)
   - proper distribution and shaping of entrance holes

Plastic Drainage Pipes vs Clay/Concrete Pipes

Advantages :

- lighter weight (0.15 to 0.5 kg/m); about 1/15 of clay or concrete pipes
- continuous lenght (5 m to 300 m in one piece) against 0.33 m to 0.5 m for clay and concrete pipes
- better hydraulic water entrance (good, well defined distribution of entrance holes) and water transport (smoothness) performance
- faster, easier and thereby usually cheaper pipe installation with or without pipe laying machine(less joints etc.)
- fittings (outlets, connections)
- chemically and microbiologically resistant

Disadvantages :

- raw material for plastic pipes
- energy consumption for pipe manufacturing
- care must be taken with PVC pipes at low temperatures (less 0 ^{o}C) and high radiation (ultra violet)
- careful manufacturing required; quality tests necessary