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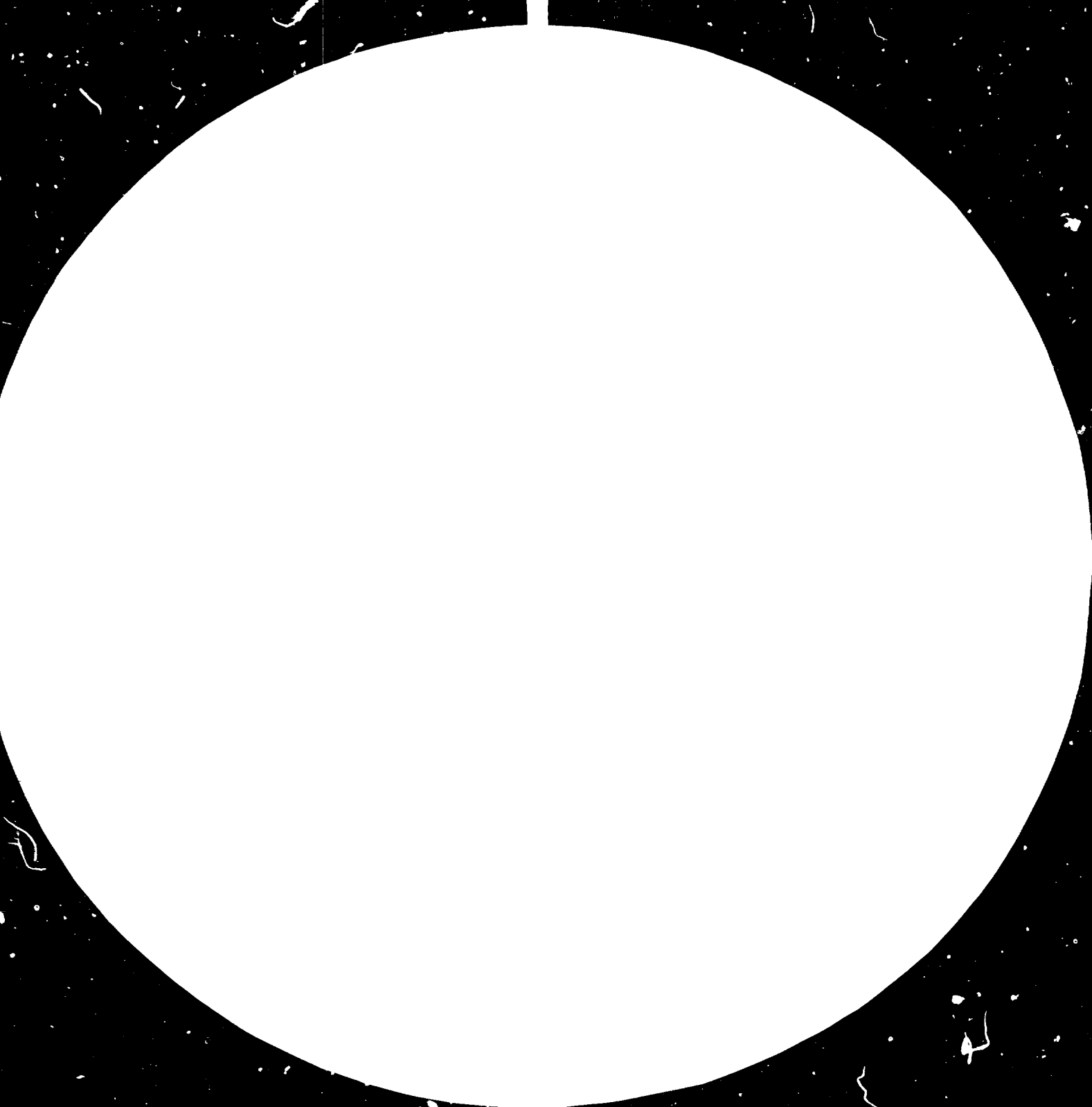
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THE PLASTICS USED IN THE AGRICULTURAL SECTOR  
AND THEIR AREAS OF APPLICATION <sup>1/</sup>

by

Sami Yüksel <sup>2/</sup>

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<sup>1/</sup> The views expressed in this paper are those of the author and do not necessarily reflect the views of the UNIDO Secretariat. This document has been translated from an unedited original.

<sup>2/</sup> Engineer, Petkim Petrokimya A.S., Turkey.

### Introduction

Regarded as a new branch in world industry, the petrochemical industry has acquired considerable importance within a short time. Turkey has followed the development of this branch with interest since its beginnings. With the founding of the Turkish Republic, this new industry was also introduced to our country, albeit on a modest scale.

After the outbreak of the Second World War, however, when it became impossible to import the raw materials, all growth in this sector ceased. It is fair to say that it was not until 1950 that the serious expansion of the petrochemical industry began and that only following the establishment of the PETKIM Petrochemical Corporation did Turkey take its first real steps towards the more effective use of petrochemical products on a larger scale.

Until the year 1960 and beyond consumption of plastic raw materials in Turkey in all areas did not exceed one kilogram per person per annum. This consumption began to rise sharply only after PETKIM started production in 1969 (despite the rapid increase in the Turkish population). The growth in the domestic consumption of plastics during the later 1970s was as follows:

1975	3.26 kg
1976	3.84 kg
1977	5.25 kg

As a result of the difficult import situation and peak price rises in 1978, consumption in that year dropped to 3.24 kg, slumping as far as 2.56 kg in 1979.

Although plastics are of great importance in Turkish industry, only one half of the raw materials are domestically produced, the other half having to be imported. PETKIM's principal products are ADPE, PVC, PS, kaprolactam, synthetic rubbers, and different kinds of carbon black. Turkey exports its surplus of synthetic rubber and kaprolactam. An Izmir branch of PETKIM is scheduled to begin production in 1982 of YDPE, PP, and the plastics for which PETKIM's Izmit facility is unable to satisfy the demand.

### The use of plastics in the agricultural sector

Rather than discuss in detail the particular plastics used in the agricultural sector and their applications, I shall limit myself to giving some general information regarding the use of these materials in Turkey.

Since plastics have come into more general use, they have also begun to find applications in agriculture. At first and for a fairly long time the only plastic product manufactured was unpressurized irrigation piping. In comparison with metals, paper, glass, fabrics, etc., these products were far less expensive. In addition to requiring very little investment capital, they were rugged, acid- and base-resistant, easily transportable, environmentally adaptable, and attractive. In view of these positive features and the fact that they require no protective coating, the demand for these products increased and they came to be used more and more for agricultural purposes.

At this time, plastics are used for the following applications in Turkish agriculture:

- Pressurized and unpressurized irrigation systems;
- Drainage systems;
- Greenhouses;
- The drying of fruit and vegetables;
- Early germination;
- Weed-control;
- The construction of man-made ponds for irrigation or fish-breeding;
- Mulching;
- Strawberry netting;
- The manufacture of fertilizer sacks;
- The manufacture of transport sacks for grain, fruit, vegetables, etc.;
- The packaging of tea;
- As a cold-storage insulation material;
- The export packaging of agricultural products.

The following table indicates the percentages of the different plastic materials annually consumed in the Turkish agricultural sector.

Type of plastic	Percentage of total production used for agricultural purposes	Area of agricultural application
ADPE	60	Greenhouses, unpressurized irrigation piping, the drying of fruit and vegetables, tea and fertilizer sacks, packaging for agricultural products
PVC, suspension	51	Pressurized and unpressurized irrigation piping, drainage piping
YDPE, suspension	1	Transport crates for fruit and vegetables
PP	40	Sacks for flour, fruit and vegetables; films for use as greenhouse covers
PS	25	Insulation lining for cold-storage areas, packaging for various products

### Conclusions

As revealed by the table above, the percentage of rigid PVC used to produce pressurized irrigation piping and of ADPE used to manufacture unpressurized piping and greenhouse covers is fairly high. Operating with modern production techniques, Turkish PVC piping plants are contributing to a steady increase in the agricultural use of these products.

The manufacturing technology for the production of PVC coverings, which are superior to those produced from polyethylene material, has not yet been introduced in Turkey, but the preliminary work in this direction has begun.

At the present time, there are 17 million hectares of arid agricultural land in Turkey. Potentially, the country could double its arable land every 15 years. Since two thirds of Turkey's export revenue is derived from agricultural activity, the application of plastics in the agricultural sector is acquiring greater importance every day.

It is said that grains will soon have the same value on the world market as oil. If this is so, it is clear that Turkey has need of every possible kind of technological aid in order to increase its agricultural productivity.

