



## Experience and Problems in Planting Winter Wheat in Reclaimed Wasteland in An Oasis Area in Xinjiang, China

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Xinjiang is located in the northwest of China and in the hinterland of Eurasia. The area is dominated by basins and deserts, with less rainfall and large evaporation. Therefore, most of the agricultural cultivation in this area is developed in piedmont oases.

Shihezi City is located in the middle of Xinjiang and has a typical continental climate. We have carried out long-term follow-up observation on two cultivated lands near Shihezi. Plots 147 # and 148 # were originally used for planting cotton, but due to the shortage of irrigation and the serious problem of soil salinization, cotton plants in these two plots were eventually abandoned. In 2008, local farmers began to use drip irrigation system to replant wheat on fallow land 147 # and 148 #. The outcome shows some achievements have been made. In 2008, the amount of irrigation on 147 # and 148 # was 360mm-405mm, and the yield was 7676kg/hm<sup>2</sup>-8879kg/hm<sup>2</sup>.

We believe that there are three main reasons for successful farming on reclaimed land:

- (1) The reclaimed land was leveled to reduce the difference in land height and improve the uniformity of irrigation.
- (2) Compared with previous flooding irrigation, the drip irrigation system can better save water and reduces soil salinization;
- (3) The application of water-soluble chemical fertilizer has changed the traditional fertilization method in the past and improved the efficiency of using fertilizer.

After ten years of reclamation and cultivation, what has attracted our attention is that there are also problems in plots 147 # and 148 #:

- (1) White pollution: In order to reduce soil evaporation brought by local heat, farmers generally use plastic mulching to cover the soil. According to the field observation and our related research, the problem of plastic film residue in the soil is very serious. At present, the density of plastic film residue increases around 16.37 kg/hm<sup>2</sup> per year.
- (2) Excessive application of chemical fertilizer causes potential soil pollution: Compared with traditional flood irrigation, the amount of fertilizer applied after the drip irrigation system is reduced, but the amount of chemical fertilizer used is still very large, which causes potential soil pollution.
- (3) The problem of soil salinization always exists: the drip irrigation system can effectively reduce the salt on the surface of the soil during the growth cycle of crops, but the salt deep in the soil always accumulates and cannot be effectively excreted.

In view of the above problems, the more effective solutions at present are:

- (1) Degradable plastic film: The new plastic film can degrade itself and reduce accumulation in soil.
- (2) New plastic film recycling machine: improve the recovery rate of plastic film.
- (3) Optimizing irrigation and fertilization scheme: Through field experiments, find out the most reasonable irrigation and fertilization scheme.
- (3) Salinization control: Different methods such as using an underground pipe to discharge salt and applying soil conditioners are adopted to control the salinization of land, but different saline-alkali land control measures have their own advantages and disadvantages, therefore, further analysis is needed in practice.