

Plasma Applications to Agriculture: Plasma Farming

Suk Jae Yoo

Plasma Technology Research Center, National Fusion Research Institute, Korea

E-mail: sjyoo@nfri.re.kr

Plasmas have been applied to various fields: The surface modification and thin film generation, semiconductor and display fabrication, development of new energy sources, and environmental improvements, plasma medical treatments, etc. In addition to the above mentioned fields, the plasma can be well applied to the agriculture and food.

In case of the semiconductor industry, the first technical innovation was caused by invention of the transistor and integrated circuit (IC) based on chemical wet processes, and the second technical innovation with the very large scale integrated circuit (VLSI) has been realized by adopting plasma processes. We can draw an analogy between the semiconductor industry and agriculture as shown in figure 1: The traditional agriculture was innovatively replaced by the chemical agriculture with much higher productivity owing to the invention of agricultural pesticides and chemical fertilizers.

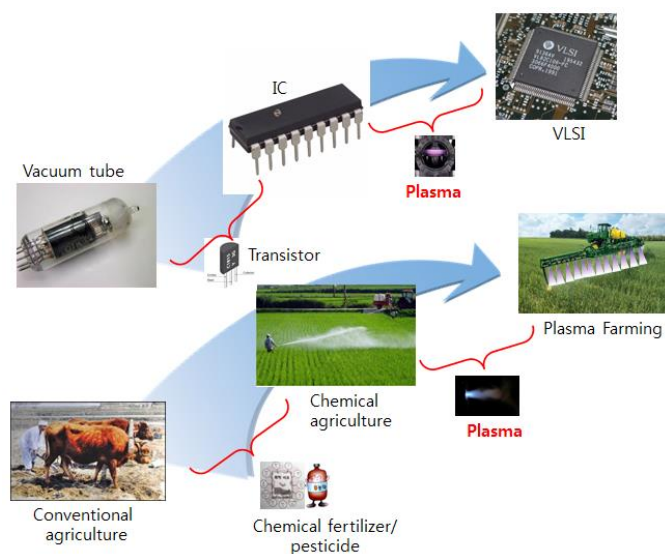


Figure 1. Analogy between the semiconductor industry and agriculture.

Due to the pesticide residue, however, the chemical agriculture has been increasingly replaced by the inorganic agriculture which has even the disadvantage of lower productivity. The problems of both the pesticide residue of chemical agriculture and the low productivity of the inorganic agriculture can be innovatively overcome by adopting the plasma technology.

In this paper, a new concept of the plasma application to the agricultural phases, 'Plasma Farming', will be introduced and some examples of how to apply the plasma technology to the agriculture will also be given.