



## Vegetable Seedling Breeding with Biochar Produced from Invasive Plant Biomass in South West of China

Guitong Li (1), Yanfang Tian (1), Cheng Liu (2), Jianhua Cao (2), Qimei Lin (1), and Xiaorong Zhao (1)

(1) Department of Soil and Water Science, College of Resources and Environment, China Agricultural University. No. 2, West Road of Yuan-Ming-Yuan, Haidian, Beijing, 100193, China (lgtong@cau.edu.cn), (2) Xi-Yu Biological Science and Technology Company in Pan-Zhi-hua, Ge-Li-Ping Industry Zone, Pan-Zhi-Hua, Sichuan, 617012, China.

Crofton Weed (*Ageratina adenophora*) is an invasive plant widely colonized in the southwest part of China, such as Yunnan, Guizhou, and Sichuan. It is estimated that the total biomass of this small shrub in China can be as much as 30 million tones. Many methods have been developed to control its malignant expansion, mostly by using its leaves as feed for livestock. Its stem is difficult to use, although it accounts for more than 90% of its total biomass.

A biochar production system, using the stems of Crofton Weed as feedstock, was established at Xi-Yu Biological Science and Technology Company, Pan-Zhi-hua, Sichuan Province, China. The system is composed of feeder, hot-air dryer, pyrolyser, activator, steam producer, and biochar-based fertilizer producer. The energy for producing hot-air to pre-dry the feedstock and steam to activate the carbonized material comes from the re-use of the heat yielded from the pyrolysis process. The whole system is in a high level of automation and energy efficiency.

With this system, local farmers can improve their income by collecting stems of Crofton Weed and selling them to the producer. It is a practical way to control this kind of invasive plant by offering economic value for the local people. The biochar can be used to produce new seedling substrate by replacing peat to protect wetland resource.

The biochar seedling media was produced in a simple way and the effects on growth of vegetable seedlings was evaluated. Results showed that the response of vegetable seeds to the biochar seedling media was different, meaning more detailed studies need to be done to find the reasons for some kinds of seeds failed to germinate in the tested biochar seedling media.

This research was supported by the Ministry of Science and Technology of China under the Public Industry Science and Technology Project (201103027).