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## Minimum Tillage Systems with Potato in Winter Cropping Regions of Subtropical China

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### Abstract

With the introduction of early maturing rice varieties in the cropping systems of subtropical China, the earlier harvesting of the summer rice crop and the later planting of the spring rice crop resulted in a fallow period of about 90–100 days of paddy rice soils in winter time. The mild cool temperatures of the season are suitable for vegetables and potato or sweet potato production. This opens the opportunity to increase food production without competing for arable land, by making more efficient use of already cultivated areas.

However, heavily worked paddy rice soils often have a high clay content and are low in organic matter, and therefore difficult to plow. In China, some farmers have tackled this problem through minimum tillage and mulching, to produce potatoes on paddy soils, with a limited amount of labour input. The system consists basically in placing potato seeds on the ground and covering them with a thick mulch of rice straw. The crop then develops with irrigation or in rainfed conditions and produces yields ranging from 15 to 30 t/ha providing farmers with an additional source of income. A product of farmer innovation, the system has not been long in use. But it has already spread across a few provinces in China.

Usually farmers use the straw from two to three hectares of rice to mulch a single hectare of potato. The rice straw is an important source of organic material that also benefits the subsequent rice crop. But there are competing alternative uses for the straw (as feed, fuel or building material) which in effect limit application of the cropping system.

Since 2008 the International Potato Center is analysing the potentials and constraints of this system via researcher and farmers surveys and the implementation of on-farm trials to improve management components and evaluate and eventually promote the system in other winter fallow regions of subtropical Asia.

**Keywords:** Farmer innovation, mulch, rice straw