Tobacco Spearing Machine
“Burley Spiker”

The widespread interest among tobacco producers in recent years for equipment to help stick harvesting methods has stimulated renewed interest in a stalk spearing or spiking machine. A self propelled machine was developed in the mid-1990s to enable mechanical impaling (spearing) of harvested plants onto wooden sticks.

One worker riding at the front grasped plants as they were cut by a saw blade, rotated them 90 degrees and placed them onto a simple horizontal chain conveyor. A mechanism then automatically conveyed and speared the plants onto a wooden stick via a ‘floating spear’ mechanism held by three sets of hydraulically operated opposed cam arms.

A second worker standing on a low platform at the rear of the machine spread the plants on the wooded stick, waited for the sixth plant to be speared, pressed a stick release switch and placed the filled stick in a ‘stick row’ position for wilting and later loading for transport to the curing facility. The second worker returned to the low platform to place an empty stick into a holder and continued the stalk spreading task until the next trip switch time.

A design capacity of one plant every two seconds was achieved which theoretically was approximately 300 sticks per hour. However, normal operation by workers with turn time, break time and stick re-loading time achieved around 150 sticks per hour or roughly an acre a day harvest capacity.

The spearing mechanism is mounted on a self propelled chassis with a 13 hp twin-cylinder gasoline engine and various hydraulic drive and control components.
Performance was very encouraging as the machine accomplished the fundamental objective of spearing plants onto conventional wooden sticks with a high degree of accuracy (97-98%). Sticks need to be sorted or cut to be within 3-4 inches of uniform length. The machine has adjustments to accommodate average stick lengths of 46 to 54 inches.

Leaf and plant damage are some greater than with hand methods depending on the condition of the tobacco. In past cutting trials, leaf loss varied from 1-2% in medium size ‘tough’ tobacco up to 5% in large ‘brittle’ tobacco.

The development of the prototype has developed to the extent that commercial manufacture is feasible and has been pursued.

Acknowledgement and appreciation is expressed for support of various producer groups and organizations for financial and product support in the development of the machine.

A video of field operation is shown on the BAE Tobacco web site:
http://www.bae.uky.edu/ext/tobacco/default.htm
(by George Duncan, UK BAE Dept., Rev.3/2009)