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Thesis Title : Prototype Design and Construction of Hardening Machine and Grinding
Equipment for Sugarcane Cutting Knife
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Abstract

Sugarcane is one of major economic crops of Thailand. Annually there are about one million ha or about 71 million tons of sugarcane harvested. In Thailand, the sugarcane is harvested either by labor or machine. However more than 95% is still harvested manually, thus knife plays important role of the cutting tool. The present knife can last for one harvesting season (about 4-5 months). Demand of sugarcane harvesting knife is estimated to be approximately 500,000 knives /season. The knife has been produced by manually hot forming and hardening. From the study, it was found that strength at hardening was not very high (<25HRC.), fluctuated and the hard area was limited. This may result in short life cycle of the knife. The study was to develop hardening machine to produce evenly harder knives which should last longer. Three machines were designed and produced. Knife produced from the machines were uniformly harder at blade. Moreover shape and size are steady with less time and lower cost of production. Grinding time was reduced from 10 to 4 minutes/knife/person and grinding and hardening cost was reduced from 12.4 to 4.5 baht/knife. Hardening level was increased to 30-40HRC and hard area was more than 10 mm. from the edge. Therefore the knife should last for about two harvesting seasons.

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Advisor