

FOOD & AGRICULTURE

Technologies for Better Quality of Life

LASER BASED LAND LEVELING SYSTEM

Water conservation is more effective in leveled fields. Land leveling is advantageous for good soil and crop management. For this reason farmers pay considerable attention to leveling their fields. However, traditional methods of leveling are cumbersome, time-consuming as well as expensive.

Unevenness of fields leads to inefficient use of irrigation water and also delays tillage. Most rice farmers level their fields under ponded water conditions. Others level the field in dry condition and check level by ponding water. Hence in both conditions considerable amount of water is wasted. Fields that are not in level have uneven crop stands, increased weed burdens and uneven maturing of crops. All such factors result in reduced yield and grain quality. Effective land leveling optimizes water-use efficiency, improves crop establishment, reduces irrigation time and effort required to manage crop.

Laser leveling systems are commonly used in some developed countries. Developing countries have also started using such techniques. The benefits are level and smooth surface, uniform germination and growth of crops, uniform distribution of water in the field, reduction in time and water require to irrigate the field, reduction in seeds, fertilizer, chemicals and fuel used in cultivation

The Centre for Advanced Technology (CAT), Indore has developed an indigenous laser based land leveling system which is very useful for Indian agriculture. The system consists of two units, a transmitter and a receiver. The transmitter generates a laser plane normal to the local plumb line by a laser diode module and rotating penta-prism. It is powered by a re-chargeable battery. The unit is sealed to protect it from dust and humidity. The receiver is based on a position sensitive detector which provides information of the location of the laser plane.

The receiver is mounted on the scrapper bucket attached behind the tractor. It is powered by the tractor battery and is interfaced hydraulically to control the scrapper bucket so that it digs in more if the height shown by the sensor is more and vice versa. As a result, when the tractor with the bucket is moved over the entire field with the receiver unit mounted, it results in a reasonably even land

surface automatically. The system developed in CAT costs about one fourth of a similar system imported from the international market.

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