

LASER LAND-LEVELING

Laser land-leveling is really laser-controlled land-leveling. The idea of moving dirt to level land is very old. (Although in agriculture most of the time we are talking about putting a smooth surface with a specific slope on the ground.) What is important with laser land-leveling is that the actual surface finish can be controlled to very tight tolerances.

Lasers are a device that produce a very concentrated beam of light. Where a common household light bulb produces diffuse light, a laser produces a single, very thin, high energy beam. Instruments can be made that respond to the energy of a laser beam.

A laser-controlled land-leveling system could be described as follows. A rotating laser light source (like a miniature lighthouse) is located somewhere in the field. As the laser rotates rapidly, a virtual "plane" of light is produced in the field. (You might think of a phonograph record rotating on the turntable as like that plane of light.)

A "receiver" is mounted on the leveling equipment and connected hydraulically to the actual earthmoving blade. When activated, the receiver (and thus, the blade) will "lock on" to the laser source, thus, providing a smooth surface.

If the earthmover has to climb over a high spot in the field, the blade will dig in as the receiver tries to stay locked on to the laser source. If the earthmover goes over a low spot, the blade will lift up, again keeping locked onto the laser source, and dump soil into the low spot. If the rotating source is tilted according to the prescribed grade, a grade can

be installed in the field. Laser setups like this are also used to quickly survey fields.

Again, the source is set up in the field. A receiver is mounted on a truck with a stationary staff gauge. As the truck drives over a preset grid, the receiver will move up or down as it stays locked on the laser source. The movement of the receiver against the stationary staff gauge is then read to record the differences in elevation throughout the field.

Laser land-leveling in itself can improve irrigation efficiency by reducing high spots in a field that back up water, or filling low spots that contribute to excess irrigation. But if you are going to spend the money for laser land-leveling, make sure you are installing the best irrigation gradients. Also, consider the placement of any tailwater return sumps and the length of your furrows.

For additional information check the [NRCS Engineering Handbook 15, Chap 12](ftp://ftp-nhq.sc.egov.usda.gov/NHQ/pub/outgoing/jbernard/CED-Directives/neh-2of2/neh15/neh15-12.pdf), <ftp://ftp-nhq.sc.egov.usda.gov/NHQ/pub/outgoing/jbernard/CED-Directives/neh-2of2/neh15/neh15-12.pdf>