



Telatemp's temperature gun can be used to precisely schedule irrigation, avoiding undue crop stress.

INSTANT INDICATOR

New Thermometer Gun Measures Crop Stress

A normal crop with plenty of water is usually as much as 11° cooler than the air, say plant scientists. However, when adequate moisture is not available, or if plants are attacked by insects or disease, plant temperature may be from 3 to 11° above surrounding air temperature.

Now, a newly developed infrared "gun" can shoot the temperature of plants and air simultaneously. "Generally, if crop temperature is less than air temperature, plants are not under stress," says Dr. Robert Reginato, researcher at the Water Conservation Laboratory, Phoenix, Ariz., who helped develop specifications for the gun and also helped field test it. Says Reginato: "We can pretty well tell if a crop is under stress by measuring temperature of plants vs. air temperature at about 1:30 to 2 p.m. But we can't tell by reading the gun whether the stress is due to lack of moisture, insects or disease. That requires closer examination of the plant."

The 2 lb. Telatemp infrared thermometer gun has been tested and evaluated in the field and was used to develop a "stress degree day" concept similar to the "growing degree day" concept often used in classifying seed corn. According to tests in California and Arizona, each day the crop temperature exceeds air temperature by 1 degree C results in one

"stress degree day" to the crop. After 15 stress degree days the crop has extracted most of the available water from the plant root zone and irrigation should begin promptly.

Thus, the first guns will be hand held precisely schedule irrigation without overwatering, or going too long between irrigations and causing undue crop stress. Extended stress accumulation can lower crop yields.

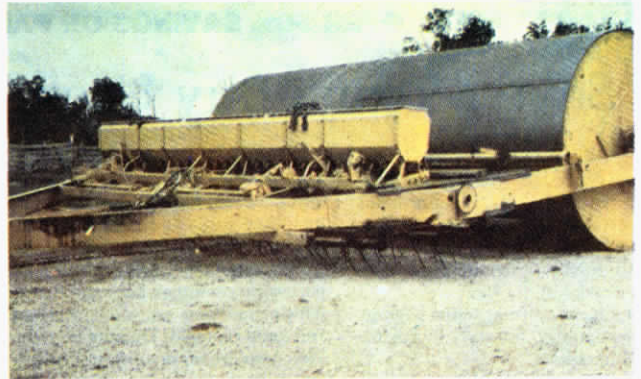
R. E. Darringer, of Telatemp Corp., says the first guns will be hand held models and most of them will be used by researchers, crop consultants or groups of farmers who invest in a gun collectively and check all their fields on a regular basis. However, by irrigating only when necessary, scientists say it may be possible to save from 4 to 6 in. of water per crop and the gun could pay for itself in one season. Retail price is right at \$3,750.

Future temperature guns, says Reginato, may be mounted in airplanes or even satellites and used to monitor large areas. Possibly, through computerized automatic controls, they might even start irrigation equipment and precisely control the amount of water applied to a given field.

For more information, contact: FARM SHOW Followup, E. R. Darringer, Telatemp, Corp., Box 5160, Fullerton, Calif. 92635 (ph 714 879-2901).



The roller buries rocks up to 2 ft. in dia., and can be used to roll established fields of grass and hay.



A 14-ft. seeder plants ahead of the giant 20-ton roller.

NEW WAY TO FARM ROCK-INFESTED LAND

Giant Roller Pushes Rocks Underground

If you've got rock problems, you'll be interested in a home-built machine that, instead of picking rocks, pushes them underground where they're out of sight and out of the way.

The rock pusher is a giant-size roller measuring 6 ft. in dia., 16 ft. long and weighs a whopping 20 tons when filled with water.

Baldur Stefanson, co-developer of this new way to farm rock-infested ground, operates 1,200 acres of rocky, clay-gravel fields near Steep Rock in central Manitoba, Canada. About 700 of those acres are seeded to grasses and alfalfa to feed his 125-head beef herd and the rest is native hay and pasture. He also leases 450 acres of pasture.

Stefanson, and his partner, Baldur Jonsson, have picked rocks for years but found that, in their soil, no matter how many they picked, there were always enough left to do damage. "We were always breaking up equipment," says Stefanson, who teamed up with Jonsson in search of a better way to farm their rock-infested land.

The giant 20-ton roller they developed is made of 3/8 in. steel plate. Ahead of the roller, 4 rows of flexible tines and a salvaged, 14-ft. long seeder dig up the soil and plant. As the machine is pulled at about 4 mph, seed is dropped, harrowed and covered by the ridge of soil pushed up by the roller. Any rocks in the way, up to 2 ft. in dia., are pushed into the ground.

"It does a good job when the ground is soft and mellow, such as in the spring of the year. We've used it for grain and flax crops with good results, and to roll established fields of alfalfa and grass," Baldur told FARM SHOW. "It does seed shallow so you might have trouble if the

ground was dry and you had dry conditions after seeding."

The two farmers, sharing the machine, pull it a little more than half full of water with an 85 hp. tractor. "Tillage work before seeding is the same as with an ordinary seeder," says Stefanson.

The inventors point out that the roller can be used any time to level and clear rocks, even after seeding with conventional equipment. They've tried it in a number of situations and are still experimenting. "We're not even sure how long one treatment lasts since we've only had the machine less than two years," says Stefanson.

Four baffles are built inside the drum for extra strength. They have holes in them so water can circulate when rotating. Axles fit tightly into pipe castings at either end of the drum. Brass bushings and sprockets, which hold the ends of the axles to the frame, are connected to the axles on the seeder by roller chains.

The only problem so far is that in real wet soil, the drum tends to bog down, no matter how much water it contains. Total cost, including work done by a Winnipeg machine shop, was \$4,000.

Stefanson notes that Canadian government researchers have done some experimenting with the new roller-seeder/rock-pusher. They think it has possibilities for reducing land development costs since, in addition to rocks up to about 2 ft. in dia., the roller can also bury roots and other debris beneath the soil surface.

For more information, contact: FARM SHOW Followup, Baldur Stefanson, Steep Rock, Manitoba, Canada (ph 204 449-2311), or Baldur Jonsson, Ashern, Manitoba, Canada (ph 204 768-2898).