

"Injected" CO₂ Gas Doubles Crop Yields

Carbon dioxide gas - the same stuff that gives a bottle of Coke its fizz - is being used in California to boost yields on strawberries, tomatoes, peppers, and other high value crops. The method works so well it might not be long before it's tried on lower value row crops.

The idea of "flooding" crops with clouds of CO₂ gas came from AG Gas, Hudson, Wis. The company is working with the Center for Irrigation Technology at Fresno State University. Strawberry yields have been increased by 30 percent, and tomatoes have more than doubled with a 120 percent increase in marketable output by weight.

The carbon dioxide is released in the crops by above-ground drip irrigation lines and absorbed by the leaves and foliage of the growing plants. It is applied during periods when irrigation water is turned off.

The process, in its sixth year of development, is called Carbogation. AG Gas is developing the methods and hardware needed to make the process possible, including storage tanks, manifolds, metering, pressure regulators, programmable logic controller, computer, and instruments in the field to monitor the carbon dioxide needs of plants.

Carbon dioxide is generated as a byproduct by several industrial applications including oil refining, cement plants, and coal-fired power plants. The California researchers get their carbon dioxide from nearby oil refineries. Stewart Erickson, chief executive officer of AG Gas, says the cost of carbon dioxide is the driving factor, especially for lower commodity crops such as corn and soybeans.

Midwest ethanol plants could become a future source of the product. "The closer the agricultural application is to the CO₂ source, the more economical it is to use. Ethanol plants are big producers of carbon dioxide,

and they produce a lower grade of carbon dioxide, which reduces the cost," he says.

The company recently set up a commercial farm-pilot project with a California strawberry grower, and is trying to sign up growers of tomatoes and peppers. "California is only a starting point for the technology. We believe that in coming years this technology will quickly migrate into other regions and even overseas," says Erickson. "We haven't tried the process in corn or soybeans, but next summer we plan to expand research into other types of crops. We've looked at center pivot irrigation systems but we don't think carbon dioxide will work with them. The gas has to be uniformly distributed throughout the entire field during daylight hours, when the crop is at a high rate of photosynthesis. It doesn't do any good to apply it at night."

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When irrigation lines are turned off, CO₂ is released through them and absorbed by leaves and foliage of growing plants.

Gas, No. 1 Birkmoor Park, Hudson, Wis. 54016 (ph 715 381-5200; fax 715 425-5400 or 7940 N. Maple Ave., Suite 108, Fresno, Calif. 93720 (ph 559 323-7706; fax 559 323-7771).

Straw Bale Shelters Protect Calves

By Georgina Campbell

Jill and Bob Jensen, Leader, Sask. found a way to protect their calves in winter with a few straw bales and a few planks and some pipe.

The 3-sided shelter, built with round bales set on end, is 4 bales deep and 32 ft. wide. A third row of bales, set in the middle of the shelter, helps support the weight of the roof.

Once the round bales were in place, the Jensens laid 2 by 8 in. planks across the top, horizontally across each row, then laid used oilfield pipe across the planks. The planks keep the pipe from sinking into the round bales.

The final step was to place square bales on top of the pipe to serve as an insulated roof.

The Jensens set up a series of bale shelters around the outside of the feedlot, which is fenced with hot wire.

"The calves will go under the electric fence and into the shelter but the cows can't get there," says Bob. "Each shelter will protect about 30 calves."

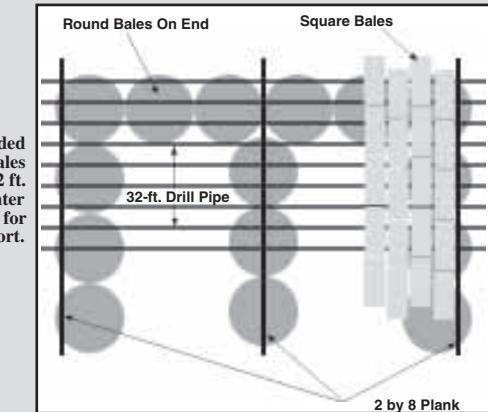
The Jensens build new shelters, using the same planks and pipe, every three or four years.

"The bales eventually get used in ground feed," Bob explains.

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Straw bale shelter for calves is quick and easy to put together.



Plastic Rock Guards Save Beans

Rock guards installed ahead of the sickle on a combine head are great for protecting combines, but they can also prevent short beans from making it into the combine. When Dennis Bollinger, president of CFC Distributors, stumbled across a different way of doing it, it seemed almost too simple to work.

"We were installing plastic sheets between the sickle and the auger on a Case IH 1020 header," recalls Bollinger. "It had a small rise in the original steel, that acted as a rock guard. The plastic sheets flattened it out so the customer asked what would stop rocks. We made some angled things and attached them to the plastic sheet behind the sickle and they worked great."

For the past 8-10 years Bollinger has made and installed the rock guards on combines in the Roann, Indiana area. This year he decided to do a little advertising, and the response has been amazing.

"We sold out right away and, unfortunately, making them from extruded plastic is a slow process," says Bollinger. "You can't just order up new stock overnight."

The UV light stabilized poly guards are only 2 in. tall and come in 2-ft. lengths. They are staggered across the width of the header to allow a smooth flow of material into the combine. The guards come with drill holes and pop-in rivets for easy installation. Bollinger even includes the correct drill bit with the kit, which is priced at \$8/foot.

"You can do a 20-footer in one to two hours," he says. "It's so simple, it's crazy. Existing rock guards often prevent short



Dennis Bollinger's plastic rock guards keep rocks out and short beans in the combine. Made from UV stabilized poly, they're 2 in. tall and come in 2-ft. lengths.

beans from getting to the platform. If you can get them to the platform, that's half the battle."

Bollinger's creations catch and hold soybeans that might normally fall off the front of the combine. At the end of the row, the beans move back into the feeder house when the header is raised up. Meanwhile, rocks are kept out.

"We've seen rocks the size of a child's head make it onto the platform and be held in front of our rock guards until the combine could be stopped and the rock removed," says Bollinger.

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Tractor Boom Ladder

"I couldn't figure out how I was going to redo the roof on my barn," says James Williams from Pontotoc, Miss. who got the job done by putting a ladder on top of his 1950 model DC Case front end boom.

"I'm at the age that climbing ladders is not completely a no-no, but at the age that being very, very careful is a must," he says.

The homemade wooden ladder, has 40-in. wide rungs and is 21 ft. long when extended. It will reach the top of almost any farm building or shed. About 3 1/2 ft. down the ladder, he put stops on it to hold large sheets of roofing so they don't slide down.

The ladder attaches to the boom with U bolts. All Williams does is drive up to the shed with the ladder attached, rest it against the roof, and climb on.

"The ladder will not slip, fall over backwards, or turn over on its side," says Williams.

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Homemade ladder is 21 ft. long when extended. It attaches to tractor's boom with U-bolts.