



PHOTO: RITA BRHEL

Contemplating Culverts

Stream-Simulation Culvert Design Reduces Flood Damage

BY RITA BRHEL
P&D Correspondent

Culvert design is probably the last thing most farmers think about, especially as there hasn't been a heavy enough rainfall or snowmelt to even warrant the use of culverts for the past 18 months.

But after the next thunderstorm down-pour washes out the lane leading into the field or pasture, how those metal tubes work to divert runoff into the ditch might come to mind.

Despite the drought, this is best time to replace culverts — before they're needed.

"A lot of traditional designs of culverts fail in 100- or 200-year floods," said Dan Cenderelli, geomorphologist for the U.S. Forest Service' Stream Systems Technology Center in Fort Collins, Colo.

In a typical rain or snowmelt event, runoff is funneled into a traditional, tube-shaped, corrugated steel or plastic culvert situated under the roadway in order to lessen the effects of water erosion on the surface of the roadway. These traditional designs date back to the 1950s and 1960s, some as early as the 1930s, on most roadways. But in a once-in-a-100-years precipitation event, this tube design simply cannot handle the large water

capacity. The effect of the funnel creates major soil erosion around the culvert, washing out the soil around the culvert, including the banks and roadway.

Additionally, the traditional design is prone to corrosion, sagging, and seam-splitting, and the life cycle of 50 years is requiring many culverts to be replaced now. Installation is done by open-trench excavation and can be costly, so it's important to look at the various options.

"Culverts should be sized, at a minimum, to handle annual peak flow and installed in a manner that will protect the culvert's strength over time," said Kurt Swearigan, a forest engineer in Taos, N.M., who consults with rural landowners.

The purpose of culverts is to allow the passage of not only water but also sediment, debris, and even aquatic animals if the culvert is placed near a farm pond or stream or wetland where fish, frogs, and other animals may use the culvert as an extension of their flooded habitat, Cenderelli says. Culverts work by redirecting runoff movement in a natural floodplain pattern, and the tube design works adequately for most weather events.

But for certain areas, such as those near aquatic habitats or in various parts of a flood-

plain, a stream-simulation design is best, Cenderelli says. Developed 15 years ago, this alternative design is a bottomless, C-shaped arch above ground so that sediment shapes water flow within the culvert. Peering inside the culvert, the water channel will not stretch from side to side, but rather sediment will be piled on one or both sides so as to create a sand bar. Not only does the channel look like a natural gully running under the roadway, but it is also flood-resistant and requires low maintenance.

The key is to place the stream-simulation culvert over a natural runoff channel, Cenderelli says. And the archway should be wider than the natural channel. Other features can be incorporated into the design of culvert ditches that tend to flood during downpour events, to inhibit water flow, such as sandbags, earthen dikes, and vegetation.

"The culvert's cross-section area should be at least 1.25 times the cross-section area of the stream, if the culvert is for a shallow ditch or seasonal stream," Swearigan said. "But if the stream is subject to flooding, you should install a larger culvert in order to avoid damage due to water backing up and flowing over the roadway during flooding."

Beef Prices Look 'Bullish' For 2013-14

BROOKINGS — The outlook for cattle and beef prices in 2013 and 2014 is decidedly bullish when examining the supply side factors, says Darrell R. Mark, Ph.D., in his Feb. 18, iGrow.org Cattle and Corn Comments. Mark is an Adjunct Professor of Economics, South Dakota State University.

"Cattle numbers are at half-century lows and any growth this year will be modest at best," Mark said. "While these supply fundamentals could push cattle and beef prices to new record highs in 2013, price advances will be limited by the willingness and ability for beef consumers to continue to pay more for beef."

While a multitude of factors affect beef demand — including prices of competing proteins and consumer tastes and preferences — Mark says consumer disposable income is of special interest in a sluggish economy.

"Generally, consumer income and beef demand are positively related; that is, when consumer income declines, beef demand declines. That's especially true for higher-valued cuts, but demand for lower-valued beef, like hamburger, can increase when consumer incomes decline," he said. "Still, during economic recessions and periods of high unemployment, beef demand as a whole would be expected to struggle. Interestingly, beef demand has been increasing for the last two years. Here's why — beef price increases have exceeded reductions in quantity of beef consumed."

When measuring beef demand, Mark explains that both the retail price and the quantity purchased (or consumed) must be considered.

"After all, demand is a schedule of quantities that consumers are willing and able to purchase at various prices. When both price and quantity decreases, demand declines. Conversely, when both price and quantity increase, demand increases," he said. "Whether a demand increase or directions depends on the magnitude of the changes and the elasticity, or responsiveness, of demand."

In 2012, beef consumption was 57.3 pounds per person. While that represents no change from 2011, it is more than 8.5 pounds lower than in 2006. The retail all fresh beef price averaged a record high \$4.69 per pound in 2012. That's an increase of \$0.25 per pound since 2011 and \$1.08 per pound since 2006. On an inflation-adjusted basis, all fresh beef prices rose \$0.12 per pound, or 3.6 percent, last year.

"So, with no annual change in consumption in 2012 and a 3.6 percent increase in prices, beef demand increased this last year," Mark said.

While beef demand hasn't in-

creased back to the levels seen in the mid-2000's when high protein, low carbohydrate diets were popular, Mark says a demand increase like that seen in the last couple of years is positive.

"However, there is more to it that generates concern for future beef demand. So far, price increases have outpaced the declines in quantity, but that will be increasingly difficult in the next couple of years as beef supplies tighten further," he said.

Beef production equals beef consumption after adjusting for imports and exports. Although the import and export adjustments are meaningful, they are relatively small and domestic consumption tracks closely to domestic production. With no herd growth occurring yet and carcass weights expected to stabilize in 2013, beef production, and therefore consumption, will fall in 2013.

Currently, Mark says beef consumption will decline almost 2 pounds per person to 55.5 pounds per capita in 2013.

"Beef consumption will likely drop below 53 pounds per capita in 2014," he said.

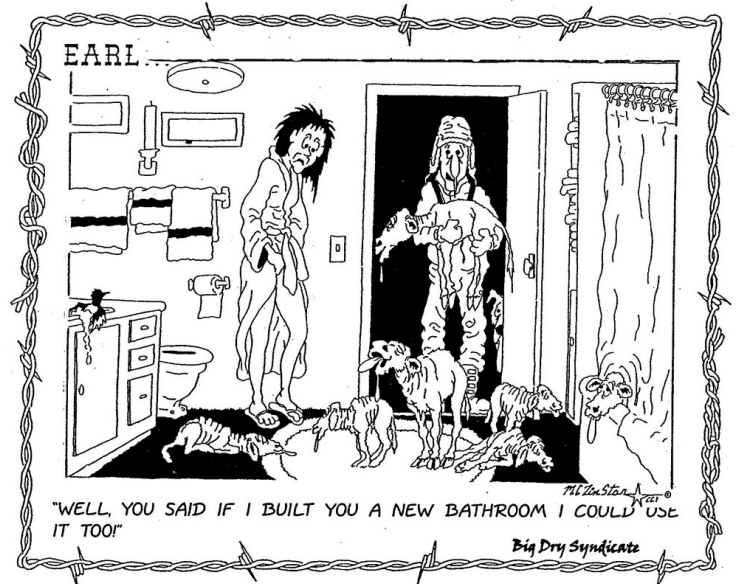
In order for beef demand to remain constant, Mark says real beef prices would need to increase by about 3 percent in 2013 and another 5 percent in 2014.

"So, the question becomes, 'how likely are consumers to pay more for beef?' There is no way to know that because consumers' tastes and preferences change and the economic outlook is uncertain," Mark said. "However, it appears like consumer resistance to higher prices is mounting."

He adds that restaurant sales are showing no signs of growth and many rapid serve restaurants are shifting menu items to focus on cheaper pork and poultry.

"Consumers are likely to make the same decisions in the supermarket when faced with even higher beef prices," he said.

To view the Cattle and Corn Comments this article is based on and past articles by Mark, visit iGrow.org/livestock.



Employee Management Workshops Slated

BROOKINGS — SDSU Extension, along with NDSU Extension, the SW Minnesota Dairy Profit Group and University of Minnesota Extension will host Ag Employee Management Workshops which will focus on hiring, motivating and retaining employees in Flandreau at the Moody County Extension Office on March 8, 15 and 18. Moody County Extension Office is located at 500 First Avenue West, Flandreau.

A unique aspect of the program is that each participant or producer will receive a follow-up, on-farm visit approximately five to six months after attending the workshop.

Each workshop will consist of three sessions with the following topics:

- Session one, March 8 — Hiring: Getting the Right People on Board, which will include information on building a reputation as a great employer, inventory of labor needs and development of job description, conducting effective interviews, reference checks, and hiring.

- Session two, March 15 — Supervising/Motivating: Will focus on the supervisor's role of motivating and training employees. This session will also take look at understanding the Hispanic culture and its influence on working relations with employees. This will be important if you employ Hispanic workers on your operation. We will also focus on engaging employees, understanding the Generation gap and the multi-generational workforce, Leadership vs. Managers and communication.

- Session three, March 18: Retaining — Keeping Employees, which will include information on fair and competitive compensation package, encourage career management planning and documentation — what is needed. Each class is limited to 30 participants.

The registration deadline is March 1. For more information, contact Renelt at 605-882-5140 or Merri Post, SW MN Dairy Profit Group Coordinator at 507-825-6784 or JW Schroeder, NDSU Extension Dairy Specialist at 701-231-7663.

Crop Variety Selection: Eliminate Emotion

BROOKINGS — The planting season is starting to sneak up on us. Now less than two months away for crops like spring wheat. If farmers have not selected or made 100 percent of their seed purchases, Nathan Mueller, SDSU Extension Agronomist may have a few tips for ways they can buy the variety that returns the highest profit per acre.

"Most people justify a buying decision after they have already made it, based on emotion. Unfortunately, seed purchases often do not escape this blight. Things that influence our selection and purchase of varieties include brand reputation, loyalty and tradition, friends and family members, advertising, and company representatives," Mueller said.

To increase farm level yields, Mueller encourages growers to utilize yield data in their variety selection process.

Yield data can be collected from side-by-side comparisons on the farm, company variety trials, and third-party variety trials.

"Reliability of this yield data is not equal. I am not talking about who (farmer, company, university) does the work, but the methodology," he said.

The three key methods growers can use to increase their confidence in one varieties performance over another include;

- Blocking or splitting the test plot into similar environments;
- Randomization or random placement of varieties within the test plot; and
- Replication or the same variety appears in the test plot several times.

Another key term Mueller explains is experimental error.

"This is simply variation in yield measured in the same variety that was tested independently several times within a test plot. The source of this variation can be soil difference in the test plot or even inability to reproduce the exact same conditions with equipment operations and measurements," Mueller said.

Mueller explains why these three methods; blocking, randomization, and replication are important when making yield data comparisons among varieties. The use of blocking, replication, and randomization helps managers of crop testing performance trials like the ones we conduct at South Dakota State University (SDSU) determine whether varieties perform differently at a location, the margin of difference between varieties, and confidence that the differences measured are attributed to the variety, not experimental error.

To review examples Mueller provides in an iGrow.org article visit, <http://iGrow.org/agronomy/corn>.

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We invite you to join us for our Worship Service
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2013 RiverWalk Kick-off

Thurs., Feb. 28 • 5- 8 p.m. • The Landing, 104 Capital St.



Get a
SNEAK
PEEK
of the new
2013/2014
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sculptures!

Help celebrate a new year of RiverWalk! The evening includes a sneak peek of the new sculptures, a nacho bar, drinks and fun. Committee members will be serving for tips and proceeds go to RiverWalk. For more information, call Katie at 660-5989.

"Ojibway River" by Chris Powell —one of the new 2013 RiverWalk sculptures.