

## **Food for thought: the myriad applications of hot dip galvanizing in agriculture**



Whether for products such as wire fences and piping, pivot conveyors for irrigation or frames and gutters for greenhouses, the agricultural sector has traditionally bought and specified hot-dip galvanizing as a preferred corrosion control mechanism. However, the Hot Dip Galvanizers Association of South Africa (HDGASA) needs to tackle a new set of challenges for the agricultural sector, according to Executive Director Robin Clarke.

“As with all other sectors, standards against which materials are supplied vary greatly. The HDGASA’s role is in educating users and specifiers to ensure that the quality of their purchases meets the correct specifications for a particular application and location,” he explains.

Specifications are based on solid science. Environmental data on weather patterns, different soil conditions and general rates of atmospheric corrosion all feed into the HDGASA’s advice to the sector: “As an example, for a sugar farmer along the KZN North Coast, we would have broad empirical data on issues such as the level of chlorides from ocean breezes, as well as rainfall and humidity metrics. Coastal regions are highly corrosive environments - and a higher specification of hot dip galvanizing would be required for something like a wire fence, pertinent to the relevant conditions and application. By contrast, a farmer in a far drier region such as Beaufort West would need something completely different,” he continues.

Clarke says hot dip galvanizing is a preferred corrosion control method for agricultural applications for two reasons:

over time, the zinc-based coating reacts with the environment to form a hard-wearing zinc carbonate patina, which is abrasion-resistant and ideally suited to dealing with wind-borne dust and animal traffic. Secondly, if the outer zinc layer is compromised by accidental impact, the zinc layer provides cathodic protection. The zinc around the fractured chip sacrifices itself as an anode, thereby protecting the carbon steel substrate.

### **Engaging at ground level**

Clarke points out that, with more emerging farmers and newcomers to the agricultural sector, the HDGASA sees an opportunity to engage with end-users more directly, to support them in applying the appropriate standards and specifications relevant to their application(s).

There are many standards when it comes to the corrosion control coating of fencing wire, and also of roof sheeting. As such, when farmers go to their local co-op, they will typically find a variety of fencing rolls in stock. This makes it hard to tell the various grades apart - and they may be induced to choose the cheapest roll. This begs the question that - although it is still fencing - is it the *correct* fencing for the KwaZulu-Natal North Coast application, for example?

Similarly, several grades of roof sheeting and cladding - and their coating grades - may be applied in the construction of barns, stock pens and the like. Again, the same challenge pertains to this application. For this reason, it is critically important that galvanized materials are clearly tagged and labelled: “It is imperative that our national standards and codes specify the use of appropriate and relevant product labelling. Those choosing unmarked products, based solely on price, do so at their own peril,” Clarke warns.

He points out that, during the 1950s and 1960s, product ranges were narrower – and were typically manufactured according to higher-end specifications. As markets opened up, a wider product range – and price-driven economic competition - drove an increase in manufacturing according to the lowest specifications.

Another challenge stems from the agricultural sector’s cost pressures and at times, uncertain future. Therefore, purchasers tend to buy on price - rather than adopting the better option of purchasing with the lifecycle costing of the material in mind.

“There must be an incentive for manufacturers to produce high-end materials. Farmers investing in their facilities are therefore encouraged to consider purchases against a 25-

year window of operations and return on investment. It is here that choosing the right specification is critical," Clarke reiterates.

### **Maintaining a complex supply chain**

He also notes that while hot dip galvanizing ensures low maintenance, end-users do need to protect their investment. An example of such preventative action includes clearing high grass around fences and fence posts. Similarly, piles of damp soil around fence posts or the sides of barns - which form a wet poultice that can be detrimental to the service life of structures – should be cleared.

That said, the market for galvanizing does not stop at the farm gate.

"Hot dip galvanized steel is a core material for many food processing facilities. From a hygiene point of view, hot dip galvanized structural elements may easily be washed down - provided there is good drainage," Clarke explains.

He adds that the HDGASA's role may also extend to advising on design - as was discovered during a recent visit to an animal research facility: "Certain design elements were not correct - and steel had not lasted as long as had been expected. Pens should be designed to ensure that faecal matter and urine do not impinge on the structural elements, thereby causing higher rates of corrosion."

### **Food for thought – for the future**

Whether it is standards, specifications or maintenance, Clarke says that one of the biggest challenges in South Africa is a serious disconnect between the formal and informal sectors.

"The formal sector certainly has exposure to standards. In most cases, large commercial farming enterprises will have to utilize the services of professional engineers who are familiar with the value of the standards required. Small-scale agricultural businesses tend to buy on price - and product quality is often taken at face value. The former requires the HDGASA's continued support - and those at the grass-roots level also need access to our assistance.

However, no matter where farmers or other enterprises find themselves throughout the agricultural supply chain, we would encourage them to see the benefits - and implement hot-dip galvanizing where it is required and appropriate. To this point, the HDGASA - and our members – can assist those in the agricultural sector to ensure that product and product sustainability meet the end user's expectations," Clarke concludes.