



# Adding Reliability to the Mix

**A Spanish insecticide and herbicide producer places heavy demands on its rotary batch mixer**

Indalva is Spain's largest toll manufacturer of insecticides and herbicides. Based in the city of Orihuela, the company is Spain's oldest producer of clay microgranules, which, along with quartz sand, are used as carriers for its insecticides and herbicides.

STEVE KNAUTH

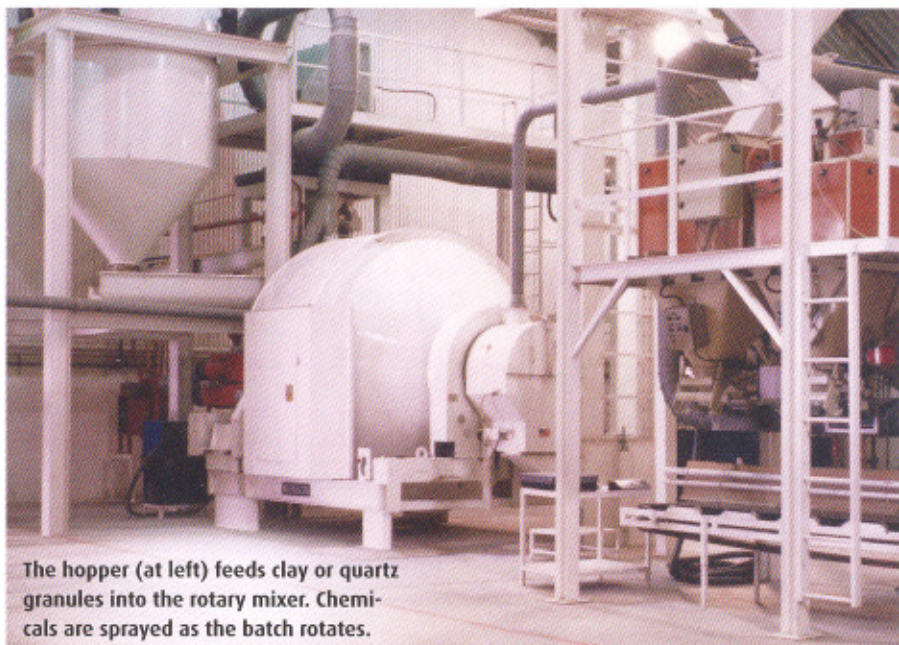
The heart of Indalva's operation is a rotary mixer of 51 m<sup>3</sup> capacity that processes all the company's granular insecticides for soil application (the major product line). Built by Munson Machinery of the USA, the Model 700-TSC-180 machine mixes liquid chemicals with the microgranules until the granules are evenly impregnated.

Since the rotary mixer is the only one used for insecticides, its reliable operation is critical to Indalva's business. "If anything goes wrong with the mixing operation it is a big problem for us," says CEO Cayetano Valero, "but fortunately the mixer has proven reliable."

The mixer has been in service since 1988, operating up to 10-12 h/d during the sowing season, and has rarely been offline except for its scheduled annual maintenance, when it is shut down for two or three days.

## Mixing Chemicals and Carriers

At a separate facility, Indalva puts raw clay through a hammer mill to obtain granules of 1-2 mm diameter. 1,000 kg bags of clay granules or quartz sand are then emptied into a hopper and transferred by a bucket elevator to another hopper above the mixer. Batch sizes range from 3-5 t. The mixer is a horizontal drum which rotates on trunnion rings and rollers, eliminating the need for an internal shaft with bearings exposed to the product. The mixer has a stationary inlet at one end and a stationary outlet, with a discharge gate, at the other. Baffles inside the



The hopper (at left) feeds clay or quartz granules into the rotary mixer. Chemicals are sprayed as the batch rotates.

drum tumble the batch in multiple directions, yielding thorough mixing while imparting minimal energy to the product.

Each product requires one or more active chemicals, which are weighed, dissolved in water and added to the batch as it rotates. The pre-mixed chemical solution is pumped from a storage tank through a tube that runs along the axis of the mixer, from which it is sprayed into the carrier material through nozzles. Different nozzle sizes and spray patterns are used for different liquids, Valero says. The clay microgranules absorb the chemicals, while in the case of quartz an adhesive included in the aqueous mixture forms a coating on the granules.

Although the mixer can achieve a uniform batch in approximately three minutes, the company runs it for 1-2 h to condition the material. At the end of the cycle the discharge gate is opened and the product goes

to the packaging line, where it is loaded into bulk bags or sacks.

Over the years the mixer has consistently produced a homogeneous, high-quality product, says Valero. He adds that the machine discharges each batch thoroughly, leaving no residual material that needs to be removed.

## Cleaning and Maintenance

Cleaning the machine between batches of different insecticides takes anywhere from four hours to an entire day. "These are dangerous products and we have to clean the machine thoroughly to prevent cross-contamination," says Valero.

Since avoiding contamination is critical, Indalva uses no chemicals for cleaning. Also, employees cannot enter the machine because of the toxic atmosphere. Instead, the company uses an inert material—usually quartz—for cleaning. The quartz is loaded into the mixer and scrapes all internal surfaces clean while the machine rotates.

Most maintenance work is done during the annual shutdown, says Valero: "We have rarely had to do repairs between scheduled shutdowns."

Anticipating continued growth, Indalva is now considering an additional Munson rotary batch mixer. "We have been happy with this machine," says Valero, "but need one that has more capacity."

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