

Environmentally Friendly Crop-Spraying System Utilizes ACE Hydraulic Dampers

When you spray pesticides on crops, the chemicals don't always land where they're supposed to—a phenomenon known as drift. Foggy clouds of pesticides and water float into the air during the spraying process, oftentimes due to wind or uneven ground. That's where the Wingsprayer comes in. This crop-spraying system reduces the amount of chemicals needed to effectively protect crops, benefitting both the environment and the farmers. Because of its large wingspan, however, vibration was an issue.

Here's how hydraulic dampers from ACE Controls overcame that challenge—while helping both farmers and the environment in the process.

Reducing Agricultural Drift. Drift creates a number of problems. For one, farmers require more costly chemicals. Because the amount that reaches the crops isn't guaranteed, plants also tend to receive too much or too little—resulting in smaller yields. And finally, the excessive, wasteful spraying is harmful to the environment.

The Wingsprayer solves these problems. The concept is simple: the Wingsprayer integrates wings—much like the ones on an airplane—that push the plants down during spraying, creating downward streams of air that steer the chemical droplets into the deepest parts of the plants. In addition, these aerodynamic airstreams form a blanket



Harrie Hoeben, the brains behind the Wingsprayer, designed the machine to reduce drift during the spraying process.

of air over the crops behind the machine, preventing the drops from escaping. And finally, it sprays small droplets which, as opposed to the traditionally sprayed large drops, completely cover the crop with a fine mist.

Harrie Hoeben, the brains behind the Wingsprayer, recently tested his system with agricultural students from Wageningen University. They found that the system reduces drift by nearly 99 percent. According to him, this technique makes it possible to spray an area ten times as large using the same amount of pesticides prior to the machine. “Our system generates a finer mist, which moistens plants more efficiently,” Hoeben said. “Our tests have shown that farmers can save a quarter of the amount of chemicals—which is not only good news for them, but for the environment too.”

ACE Hydraulic Dampers To The Rescue. But the Wingsprayer doesn't just rely on wings. To operate safely, it utilizes hydraulic dampers from ACE Controls. Otherwise, the sheer size of the Wingsprayer would cause it to shake during operation—to the point where the machine could damage itself. Hoeben wanted to avoid this outcome. Before integrating the braking elements, ACE engineers conducted a series of field tests to account for some of the variables the Wingsprayer typically runs into—namely, the wind and uneven ground. But even under these dramatic conditions, the machine did not shake.



To prevent the machine from shaking to the point of damaging itself, the Wingsprayer integrates ACE hydraulic dampers.



The wings on the Wingsprayer push the plants down, creating downward streams of air that steer the chemical droplets into the deepest parts of the plants.

These braking elements (type HB-15-25), which resemble industrial gas springs, are adjustable—enabling engineers to stabilize movement in both the push and pull directions. Thanks to a broad selection of end fittings, these components are easy to mount and can be used as a single- or double-acting brake for a variety of applications, from conveyors to sports equipment. They also feature an outer-body diameter of 0.59 inches, maximum stroke of 0.98 inches and a wide temperature range of -4 to +175°F.

For the Wingsprayer, ACE delivered a double-acting variant capable of a maximum compression force of 179.85 pounds, stabilizing the machine even on very windy days. Since integrating these components, the machine has operated safely and efficiently—and to this day, continues to have a positive impact on the environment.

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