Twin fluid nozzles balance air and liquid pressure to produce a defined spray quality that gives good crop coverage and adherence, which helps pesticides do their job as effectively as possible.

Push-button control gives Airtec the edge

By Peter Hill

Twin fluid spraying systems offer between 50% and 100% more acres treated per fill, enhanced drift control and the potential to cut pesticide rates.

"There's a perception that twin fluid spraying is more complex; for another there's little doubt that the £5000 and £8000 cost of an Airtec system is a barrier to many potential users," says Julian Weston of Cleanacres Machinery.

"The reality is that Airtec's electronic controls make it no more difficult to use than a conventional sprayer and the work rates, spray controllability and level of pesticide performance it offers make it a worthwhile investment."

All the features of twin fluid spraying, which today is available in the form of the Cleanacres Airtec and TeeJet AirJet designs, are achieved by mixing compressed air and atomised liquid in a purpose-designed nozzle.

This produces a more defined droplet size than a conventional flat fan tip and this, together with the fact that the larger droplets tend to collapse upon impact with a leaf surface because they contain tiny bubbles, generally results in better coverage.

Claims for the ability to cut pesticide rates – as opposed to water volumes – are controversial. Cleanacres reckons to have plenty of trials and anecdotal evidence to support its position.

For many growers, the controllability of spray output and the work rates that come from applying dilute pesticides at 80 litre/ha or less compared with standard rates of 100-200 litres/ha, is more than enough to justify the investment.

Dorset grower John Martin puts the higher cost of his 2500-litre/24m trailed Airtec sprayer in perspective.

"If my average spend on pesticides for 324ha (800 acres) is £35 to £40/acre and I keep the sprayer for 10 years, I'll be using it for up to £320,000-worth of pesticides designed to protect the yields and quality of my crops," he points out.

"On that basis, spending an extra £7000 on a system that gives me higher work rates, more spraying days and drift control settings at the touch of a button, is diddly squat."

He runs the farm more or less single-handedly and places a high value on the time-saving aspect of Airtec spraying.

"I'd rather spend time with the kids than work all day on the sprayer, and when you can do more than 30ha (75 acres) per fill, you cover the ground pretty quickly, even at a sensible 10-12kph," he says.

"But I'm also confident that I'm doing the best possible application job because of the characteristics and controllability of the system."

There is little doubt that poten-

CEREALS VIEW

* Twin fluid spraying has the potential to significantly reduce liquid application rates and reduce drift. These two factors alone extend spraying possibilities and allow applications to go ahead in a wider range of weather conditions.

TWIN FLUID FEATURES

* Push-button selection of a choice of spray qualities
* Consistent spray quality across a range of application volumes and working speeds
* Target coverage makes applications effective at water volumes down to 75-litre/ha resulting in higher work rates
* Minimises blockage risk

tial users of early Airtec sprayers were put off by having to manually control both air and liquid pressure settings after referring to a sizeable calibration chart. John Martin's has the "Magic Box" controller, based on RDS hardware, which provides push-button access to defined "very fine", "fine", "medium" and "coarse" sprays that suit different targets and weather conditions.

"The great thing is you don't have to choose a particular nozzle and then either stick with it through the day or stop to change it if you need a different one," says John Martin. "If I'm using the 'fine' setting and the wind picks up, I can switch to a slightly coarser spray that's more drift resistant."

He mostly uses the "fine" and "medium" settings, although "very fine" is used to ensure good droplet coverage and adherence to wild oats when perfect weather conditions allow.

Most applications are at 80 litres/ha with some – such as an autumn aphicide on cereals – at just 65 litres/ha in favourable conditions. Situations that demand a thorough wetting of a mature crop – when applying an oilseed rape insecticide in the spring, for example – would be done at 100 litres/ha.

Spare Airtec nozzle – taken apart to show body, restrictor, anvil flood jet and cap – is rarely needed thanks to durable design and build.

Pesticides are always applied at recommended rates, Mr Martin emphasises: "I'd rather use Airtec to make best use of the chemical than try to save a few pence by cutting the rate and risk compromising the performance."

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NOZZLES – HOW DO THEY WORK?

- A conventional **flat fan tip** forces liquid under pressure through an outlet hole that atomises and forms it into a fan-shaped pattern of droplets that cover a wide range of sizes.
- A **pre-orifice tip** cuts drift by producing a tighter range of droplet sizes; it meters liquid through an internal orifice then atomises it at a lower pressure.
- An **air induction tip** works in a similar way except that air drawn in through venturi holes forms bubbles inside the larger droplets.
- **Twin fluid nozzles** atomise the liquid as it enters a swirl chamber where compressed air is introduced. The two fluids combine, forming bubbles inside the droplets. The fluids are shaped into a flat fan before being propelled into the crop.

Using application volumes of 80-litre/ha for most treatments means John Martin's twin fluid sprayer makes fewer trips to the yard.

Sprayer Operator of the Year

With 21 years of spraying behind him Mr Smith makes full use of the technology on offer to squeeze maximum output from the sprayer on available spray days.

Output is further enhanced by application rates down to70 litres/ha. "The Airtec is fantastic, allowing us to use low water rates, which is really important with blocks of land all across the Leicestershire/Nottinghamshire border. At 75 litres/ha we can do 100 acres with each load, saving a lot of downtime running backwards and forwards to refill."

When the pressure is on, spraying starts at dawn and ends at dusk, with farm owner Tim Kirk sharing the work. Up to 162ha (400 acres) can be sprayed in a day – vital when 405ha (1000 acres) of milling wheat needs a flag leaf spray in two to three days and an orange blossom midge spray within an optimum window of just two days.

"The Airtec also helps us work with drift more under control," Mr Smith notes. Some fields have 6m ELS margins and a coarser spray can be selected around houses at the touch of a button.

"You've got to show local people some respect when spraying," he contiues. "There's no point working near houses first thing in the morning or on a Saturday evening when people are out having barbecues. It's commong sense really."