

AgAir *update*

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AG AVIATION'S NEWSPAPER

Terra Aviação Agrícola - Precision, quality based on equipment product testing



Julio Kampf of Terra Aviation in Cachoeira do Sul, Brazil applies Roundup with an Ipanema using AU5000 rotary atomizers at seven liters per hectare (0.7 gallas) application rate. Note the dense weed growth on the contour banks in no-till rice field.

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Terra Aviação Agrícola — Precision, quality based on equipment product testing

by Alan McCracken
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Terra Aviação Agrícola in Cachoeira do Sul, RS, Brazil (terraviacao@terra.com.br) is a leader in providing quality ag-spraying service. Based on regular testing of both the equipment and chemical products, they have compiled a database of how the products perform. The three owners of this efficient operation, Julio Kampf, Diego Preuss and Wagner Patta, are devoted not only to flying, but also to providing a quality service to their customers. During my visit, I had the opportunity to assist with a number of spray trials, including a commercial




The three owners of Terra Agricultural Aviation of Brazil, Diego Preuss, Julio Kampf and Wagner Patta.

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••••• ACCURATE COST EFFECTIVE SPRAYING •••••

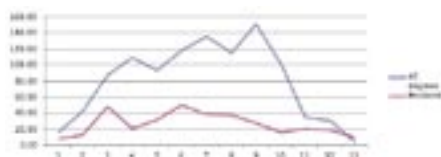
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application of glyphosate with a total spray volume of only seven liters/hectare (0.7 gal/ac), which gave excellent results.

Julio has a very clear strategy for his business: Using low volumes and adjusting the droplet size according to the conditions. His “Kampf” battle is to strive for improved efficiency and better results in addition to being very active as the current President of the Brazilian aerial applicators association, SINDAG.

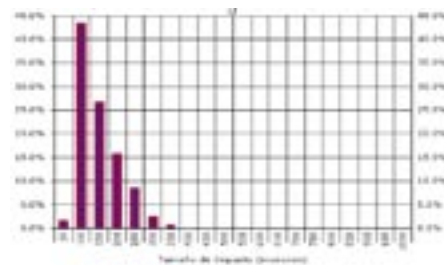
Water sensitive cards:

We conducted numerous application tests and concluded dye check cards are very poor tools for assessing swath uniformity. With the angle of the paper cards inclined at 45 degrees, the droplet collection was dramatically more effective than when it was placed horizontally. (See graph-1 of droplets collected during one test).

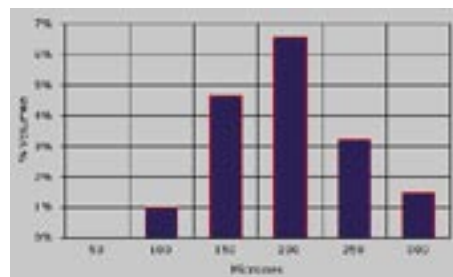


This means the larger droplets may be deposited on the horizontal cards, but do not necessarily penetrate the crop canopy, hence resulting in poor control. The performance of the chemical products depends directly on the efficiency of the application and that the equipment is adjusted to provide a narrow droplet spectrum tailored

to the requirements of the product and the crop target. (See graph-2 that illustrates results from rotary atomizers applying eight liters/hectare (0.8 gal/ac))



The volume of spray in each droplet category is also very important [See graph-3),



with a smaller droplet size yielding a very high degree of efficiency.

Droplet collection/product efficacy:

It is a well-established fact that pyrethroid insecticides have not been performing as well as expected in many cases, especially within the USA. Even so, they continue to deliver excellent performance and are well known for their effect of “rapid knockdown” throughout Argentina and Brazil. The reason is that these products work by contact and ingestion action with no vapor effect, which means that for good results they must be


delivered to the target insect. In the USA, practically all product labels specify high volumes of water, i.e. two to five gallons/acre (20 – 50 liters/hectare), making these products highly diluted with water. Furthermore, when applied in high volumes of water,

the product is delivered with large spray droplets resulting in grossly inadequate crop penetration and minimal contact with the insects. The results occur after the insects find the chemical.

However in Argentina and Brazil, most of the applicators apply



Julio Kampf holds a flag to direct Wagner Patta in his Terra Agricultural Aviation C-188 Ag Truck over the test area to check droplet size.



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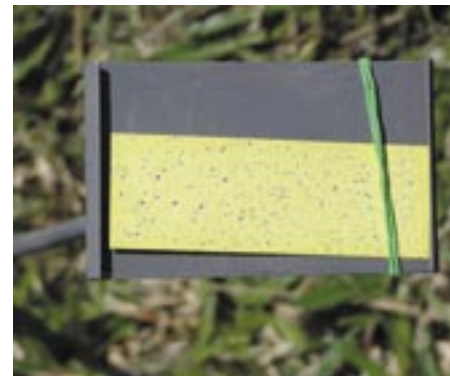
Julio Kampf, Alan McCracken and Diego Preuss discussing the uniform droplet sizes produced by the rotary atomizers.

the products using low application rates of 5 - 10 liters/hectare (0.5 - 1.0 gal/ac) as well as very low volumes (ULV), typically with the products being mixed with a non-volatile oil to protect against evaporation loss. This combination requires the use of a high speed

mixing system to ensure adequate mixing and stability of the products.

Asian rust

The same principles apply to the control of Asian soybean rust, since for adequate control we



Superb deposition of uniform sized droplets suitable for the application of fungicides or insecticides on soybeans.

must have excellent crop coverage. During the past four seasons in Brazil, very large areas of soybeans have been treated successfully using low volumes of 5 -10 lts/hectare (0.5 - 1.0 gallon/acre) by aircraft utilizing oils and selected adjuncts to minimize evaporation losses with results significantly superior to those obtained with high volumes. Terra Aviacao Agricola is now extending this experience for the application of

fungicides on maize. Recent trials have confirmed that low volumes gave excellent control of percevejos fungi (*Cimex lectularius*) in addition to rust control.

Spray Volume

The key to success is the production of uniform droplet size and not the volume of water. In seeking to obtain increased spray coverage, it is far more important, and more economical, to decrease the droplet size than to increase the spray volume. Many entomologists/agriculturalists have thought that higher volumes mean better coverage; this is erroneous and has led to the following:

- Lower volumes have been proven to be more effective than high volumes in Brazil and Argentina for most all categories of application including insect control, rust control and crop desiccation using glyphosate. Within my personal clients and contacts,



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an estimated two million hectares (five million acres) were successfully treated last season using volumes of 10 liters/hectare or less (one gal/ac), with the best results around five liters/hectare (0.5 gal/ac) with aircraft for rust control. With ground equipment, the best results were with 20 – 40 liters/hectare (two – four gal/ac) depending on the forward speed of the equipment.

- The chemical is more concentrated, enabling higher efficacy, such that a single spray droplet may be adequate to kill a particular insect.

- For mechanical reasons, it is easier to atomize a lower volume of liquid using smaller spray atomizers/nozzles.

- When applied in oils, the chemical products are more resistant to wash-off by rainfall, resulting in longer residual action.

- Higher productivity of the sprayer, as less time is wasted because of multiple trips to the airport to refill with water.

- Lower volumes means higher productivity in terms of hectares per hour. Spraying can often be finished before mid-day when the weather usually becomes less favorable.

Julio Kampf has demonstrated to his customers that low volumes can provide superb coverage provided he adjusts his application equipment to match the droplet size to the required chemical

product and environmental conditions at the time of application.

It is absolutely a necessity to conduct application tests with the equipment using the chemical products to be applied to identify the optimal adjustments to obtain consistently good results.

The only high volume approved at Julio's operational base is for a shower after work and the volume of beer needed to wash down an excellent barbeque, with a minima of one skewer of meat required per person.

Air Tractor Sales and Service

Terra began sales in the ag-aviation marketplace in 1989. Terra Aviação Agrícola was selected by Frost Flying Service to be its Air Tractor representative in Brazil in 2007. Terra's partnership with Frost Flying Service allows them to provide the service and support necessary for their customers to upgrade to the Air Tractor. It

also provides support and service for new and used aircraft parts, as well as used ag-aircraft.

Diego Preuss has prepared a simple, yet effective, spread sheet to assist operators and farmers in assessing the true costs of operating ground rigs versus the advantages of ag-aircraft, see www.terraaviacao.com.br/airtractor.html. Terra has a new operation in Cruz Alta and will have a booth

at the Mercosul convention in Foz do Iguacu, Brazil in June of 2008. They invite all attendees to visit with them. Diego, Wagner and Julio can be reached by phone at: 51 37237091 and fax: 51 37230345, vendas@terraaviacao.com.br, www.terraaviacao.com.br



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