



ROGATOR 1084

4 164 LITRES



Using sophisticated equipment means that we can apply pesticides economically as well as insure that the job is done cleanly and effectively. It is with this in mind that we decided to present a technological and mechanical jewel: the RoGator 1084.





The trial of the RoGator 1084 took place in spring 2009, north of the 49th parallel in Northern America's corn growing area. This one day trial was supervised by the Station. The object of the trial consisted of evaluating the performance and manoeuvrability of the sprayer while in action. The trial began with a "tour" of the self-propelled sprayer.

POWERFUL AND EFFICIENT

The RoGator 1084 comes equipped with a Tier 3, 275 hp at 2,100 rpm/min Caterpillar engine that develops its maximum power at 299 hp at 1,850 rpm/min (photo 1). This is a 6 cylinder, 7.2 L turbo compressed engine. The engine torque rises to 977 lb/ft. As for the RoGator 1386, it comes equipped with a Cat C9 Tier 3 engine which produces 311 hp at 2,100 rpm/min developing a maximum power of 336 hp at 1,900 rpm/min. The die-

sel tanks have a combined capacity of 492 L (130 gal.). The fuel is distributed equally to the two reservoirs located on either side of the machine. The hydraulic reservoir contains an appreciable quantity of oil, 227 L (60 gal.) since everything on this machine is operated hydraulically. The large reservoir also serves as an oil cooling system.

All this power has one task to accomplish: turn three hydraulic pumps. The first two pumps are hydrostatic pumps mounted in tandem. These are 7.6 in/cu Bosch Rexroth pumps. The operator can choose four speed ranges with a speed selector situated on the joystick (photo 2). The four speed ranges are: 0-19 Km/h, 0-24 Km/h, 0-30 Km/h and 0-52 Km/h. Operating in normal conditions, such as on relatively dry soil that provides good weight support in June, the operations were done in the second speed range between 20-24Km/h, which meant that a lot of ground could be covered in a short

period of time. On the road, the fourth speed range will be used a great deal as will the hydrostatic system which acts a braking mechanism. A floor pedal is used to engage the two multidisc clutch packs located on the front wheels and which serve as emergency brakes (photo 3). These brakes are not to be used unless the machine is stopped. They can always be used in cases of extreme emergency but they block the wheels regardless of the forward speed.

The air compressor is also mounted on the engine. This compressor serves two functions on the machine. It generates the foam in the reservoir which has a 30 gallon capacity for the foam markers. Why put a foam marker on a machine that has auto guidance? The reason is really very simple. Some fields are too small or too irregular for the automatic guidance system especially at more than 20 Km/h. In these cases, the best reference is still foam.

The second function of the compressor is to empty the rest of the product in the ramp tubing. The conventional method of cleaning a sprayer is to use clean water. This is a limited resource in the field and also means a surplus load to carry around in a second reservoir just for the purpose of cleaning out the machine. Since this requires the water to be circulated in the main reservoir and emptied through the rail, it requires another pass through the field. In the RoGator 1084, the air compressor empties out the rail thus reducing the need for clean water.

SPRAYING SYSTEM

The RoGator 1084 has a main stainless steel tank with a capacity for 1,100 gal. (4,164 L). Stainless steel has a big advantage over plastic because it is not po-

rous. The surface of plastic looks smooth and flat but a microscopic image reveals millions of miniscule holes. Some of the products used in our fields can leave an incrustation. Other products are soapier and when placed in the reservoir dislodge the molecules stuck in the cavities which can cause problems when these molecules are not adapted for the particular crop. The surface of stainless steel is completely even and this minimizes the risk of contamination. The RoGator reservoir has an elliptic shape and has a sump the length of the reservoir. At the center of the sump, a 4 in. diameter tube ensures that the tank is emptied almost completely even is the machine is on a slope.

The system is equipped with a Hypro 9306 pump with a modulating valve. There is a +/- 1 psi variance from one boom to the other on each of the nozzles and this with a minimum application rate of 10 gpm (37.85L/min) to a maximum application rate of 139 gpm (514.8 L/min). There are five sections on the boom which are controlled from the joystick.

Four boom lengths are offered in this series; 80, 90,100 and 120 ft. The RoGator that we observed was equipped with a 100 ft. automatic boom Raven system. This system sends ultrasound to the soil which measures the distance between the boom and the soil and automatically adjusts the height of the boom extremities to the height chosen by the operator (photo 4). A tip break away system is located on the boom 30 ft. from its center (photo 5). If the end of the

boom comes in contact with a solid object, this system causes the boom to fold towards the rear. It also means that the operator does not have to get off the RoGator in order to reset the boom. The hinge has a spring and a shock absorber. Once the obstacle has been passed over the spring pulls the end of ramp towards the front and the shock absorber cushions the blow caused when the end of the boom returns to its position. The boom has a complete break away. In the case of an obstacle 30 ft or less to the side of the machine, the entire boom folds towards the rear. In this case, a nitrogen accumulator is connected to a cylinder which permits a play of about 45% towards the rear. It is, however, necessary to press a switch in the machine to reposition the boom.

During the trial, the operator used the air induction nozzles on the RoGator (photo 6). These nozzles are mounted on a 5 nozzle body spaced 30 inches apart. These nozzles are very efficient coun-





tering drift by sucking air in two small openings on both sides and mixing the air into the product to form bigger droplets that are less likely to drift.

CHASSIS, DRIVING AND SUSPENSION

A very distinctive feature of the RoGator is that the chassis is made up of two C-channel beams that run the length of the machine, such as is found in a truck (photo 7). The C-channel frame gives the machine great flexibility. The entire body of the chassis twists when the RoGator hits an obstacle. This means that the 4 wheels remain in contact with the soil longer. The machine is designed to deal with this type of contraction; all the parts are bolted on the machine, nothing is welded. The tank, walkway and boom are mounted on a separate chassis held on to the machine by 4 bolts at the 4 corners with two of the bolts fitted with springs.

The basic RoGator 1084 has front directional wheels. However, the equipment tested by the Station was equipped with 4 directional wheels (photo 8). This option

means that the turning radius of the machine is reduced from 7 metres to 4.1 metres. Another advantage is that the rear wheels are engaged in the tracks left by the front wheels resulting in less damage to the soil and to the crop. This is an expensive option which increases the number of moving parts on the machine. Regardless of the cost, the operator couldn't pass up this option.

We noticed a very interesting detail on these machines: all the cylinders are covered in a black protective layer against rust. This covering is really useful in some Canadian provinces and American states where these machines are used to apply liquid nitrogen, a very corrosive fertilizer. As well, once the machine is completely assembled, the connectors on the all the hydraulic hoses are cover in a layer of protective paint.

The two exterior axles are made of 8 in. X 8 in. steel beams and the interior axles, which allow the machine to expand the wheel

base, are 6 in. X 6 in. (photo 9). The wheels can be moved 120 to 152 inches apart, center to center.

The RoGator suspension is made up of leaf springs on four wheels, a shock absorber and the lateral support bars (photo 10). This suspension is both very simple and very efficient on the road as well as in the field. With a full tank, the feel of driving the machine is firm and agreeable.

THE CAB

The RoGator 1084 cab is one-of-a-kind in this industry having been designed exclusively for fertilizer application. It has 60 sq.ft. of glass as well as an air cushioned seat. The ventilation system is very efficient and has three filters. The first filter is on the exterior of the cab (photo 11). The second is in the ventilation system. The third is carbon-activated and constantly filters the air in the cab.

An impressive joystick is the main piece of equipment on the armrest to the right of the seat

(photo 2). On it, are 12 functions; the five valves for the boom sections, 2 controls for the height of the boom extremities, the main valve for the foam marker control and 2 switches for the speed ranges. On the console itself are several functions for wheel spacing, the height of the boom and the LCD screen which provides information on the state of the machine and its operation. The ceiling of the cab has two pressure dials, one for pump pressure and the other for nozzle pressure. The operator thus has all the necessary information at his fingertips and within his field of vision.

We ended our "tour" by paying attention to some of the little details that the designers of the RoGator decided to incorporate into the machine. First of all, at each point where the hydraulic hoses are in contact or risk coming into contact with each other, a supplementary rubber layer has been added. As well, the drive wheels are very well concealed in the interior of the wheels which is quite an accomplishment since the wheels are only 14.9 in. thick. And finally, the axle is installed at an angle in order to make the profile thinner so that the crops are damaged as little as possible. Watching this machine in the field was impressive and the operator had the pleasure of pushing it to its maximum. ■



TECHNICAL SPECIFICATIONS ROGATOR 1084

SUSPENSION

Type : Variable Rate Leaf Spring and shock absorbers

STEERING

Cylinder : double acting
Turning radius center : 24 ft (7.3 m) of axle (2-wheel steer)
Optional Gator Track : 13.5 ft (4.1m) (4-wheel steer)

CAB

Glass Area : 60 sq. ft. (5.5 sq. m)
Floor Area : 14 sq.ft. (1.3 sq. m)
AM FM Radio with Weather Band/ Satellite Ready
Ventilation : Automatic Temperature Control
Filtration : Three Level Activated Carbon

AIR SYSTEM

Compressor : Engine Mounted
Capacity : 13.2 cfm (6.2 L/s)
Reservoir : 12.5 gal. (48 L)

FLUID CAPACITIES

Fuel : 130 gal (492 L)
Hydraulic Reservoir : 60 gal. (227 L)
Engine Oil : 24 qt. (22.7 L)
Engine Coolant : 34 qt. (32 L)
Gear Box : 4.5 qt. (4.3 L)
Windshield Wiper : 1.6 qt. (1.5 L)
Weight when empty : 25,030 lb (11,353 kg)