

BELUGA: TRACK-TYPE TRANSPORTER FOR OIL PALM FIELD ACTIVITIES IN PEAT AREAS

MOHD SOLAH DERAMAN; ABD RAHIM SHUIB; AHMAD TARMIZI MOHAMMED; ZAPRUNNIZAM MOHD ALI; AMINULRASHID MOHAMAD and HARTINI HASAN*



MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2012

MPOB TT No. 504

It is a challenging task to evacuate bunches from oil palm planted on peat or soggy areas. Apart from low bearing capacity of the peat, undecomposed or semi-decomposed logs along the harvesting paths require a specially designed vehicle to tackle this problem. The new concept vehicle is specifically built for infield collection on peat and soft ground conditions.

THE MACHINE

This track-type transporter is called *Beluga*, a name derived from a white whale, which has excellent manoeuvring and navigating capabilities. *Beluga* was designed with a single chassis, compact and robust with the most efficient weight distribution ratio and least ground pressure. The machine is equipped with a rubber crawler having a life span of 2000 operating hours and gives superior 'flotation' and instinctive traction on soft grounds such as peat soil. *Beluga* is easy to manoeuvre using a joystick that is very intuitive and capable of carrying 1 t of fresh fruit bunches (FFB).



Loading fresh fruit bunches (FFB) into the bucket.

SPECIFICATIONS

Overall Dimensions	
Overall length (with bucket)	2 790 mm
Overall width	1 500 mm
Overall height (without cabin)	1 640 mm
Overall height (with cabin)	2 017 mm
Overall System Specifications	
Rated operating capacity	1 000 kg
Operating weight	1 400 kg
Travel speed	15 km hr ⁻¹
Bucket tipping type	High pivot tipping
Drive type	Crawler type
Track type	Rubber crawler type
Traction pump	Piston
Traction drive	Direct connection to drive motor
Steering type	Hydraulic joystick
Traction braking	Hydraulic
Departure angle	40°
Track width	400 x 1250
Ground pressure	0.22 kg cm ⁻²
Engine type	Kukje A1700 35 hp water cooling diesel with electric starter
No. of cylinder	3 cylinder in line
Max torque	11 kg.m/1600 rpm
Engine weight	165 kg
Service Fill Capacities	
Fuel tank	52 litre
Cooling system	6.5 litre
Hydraulic reservoir	38 litre
Engine oil	3.5 litre

*MIZOU Holdings Sdn Bhd.

ISSN 1511-7871



9 771511 787001

Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, Malaysia

P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. Tel: 03-8769 4400 Fax: 03-8925 9446 Website: www.mpo.gov.my

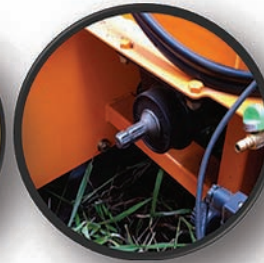




Fitted with special rubber crawler.



Easy to operate and manoeuvrable using a single joystick control.



Incorporated with power take off (PTO).



Designed with high pivot tipping to reduce repetitive work (double handling).

ADVANTAGES

- Mechanisation activities made possible in peat areas hence reduce labour requirements.
- Increase worker's productivity, 16 – 20 t per day.
- Fitted with special rubber crawler.
- Easy to operate and manoeuvre using a single joystick control.
- Incorporated with power take off (PTO).
- High pivot tipping to reduce double handling.
- Granted JPJ Vehicle Type Approval.

FIELD TRIALS

A field trial was conducted at an estate in Sepang, Selangor from August to September 2011. From this trial, the productivity ranged from 16 to 20 t per day with minimal fuel consumption of 10 to 12 litres per day.

ECONOMIC FEASIBILITY

The cost to produce one unit of *Beluga* is about RM 60 000. The investment in *Beluga* production is attractive with a payback period of 3 years (*Table 1*).



Beluga with high pivot bucket.

TABLE 1. RESULT OF FINANCIAL ANALYSIS

Internal rate return (IRR)	34.52%
Benefit to cost ratio (B:C) @12%	1.05
Net present value (NPV) @12%	RM 188 392
Payback period (PBP)	3 years

CONCLUSION

The *Beluga* is designed for transporting FFB in difficult areas such as peat and soft grounds. The *Beluga* performed well under these field conditions. Besides infield transportation of FFB, the *Beluga* can also be used for other activities such as fertiliser application, weed control and maintenance. The machine is able to reduce labour as well as improving the productivity and income of the workers and plantations.

For more information, kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
Tel: 03-8769 4400
Fax: 03-8925 9446
www.mpob.gov.my