

Curriculum Vitae

of

Richard Lea Sulman

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MEMBERSHIP:

- **Commercial Affiliate to the National Centre of Engineering in Agriculture University of Southern Queensland, Toowoomba**
- **Member of the American Society of Agricultural and Biological Engineers**
- **Member of the Institution of Engineers, Australia**
- **Member of the Australian Steel Institute, Australia**

TERTIARY EDUCATION:

- **Bachelor of Agricultural Engineering (Honours)**
University of Southern Queensland
Toowoomba, QLD 4350
- **University of Manitoba (Undergraduate)**
Faculty of Biosystems Engineering
Winnipeg, Canada
- **Qualified Tradesperson (Fitter and Machinist)**
Registration No: 9009803
L & M Secombe Engineering
Tamworth, NSW 2340
- **Certificate in Fitting and Machining**
Faculty of Engineering
New England Institute of TAFE
Tamworth, NSW 2340

EXPERIENCE:

Position: Managing Director

Company: Biosystems Engineering Pty. Ltd (ABN: 78 219 454 938)

April 2000 – Current

- **Consulting Engineer to the Wagga Wagga Shire Council**
 - Prepare a scoping study to investigate effective methods for removing manure waste from the livestock sale yards.
- **Consulting Engineer to the National Centre for Engineering in Agriculture (NCEA).**
 - Surveying and data collection for a 'Grains Research and Development Corporation' funded scoping study into the use of 'Large Mobile Irrigators in the Cotton Industry'.
 - Design, manufacture and testing of a Hardwood Chipper for Dr Harry Harris (University of Southern Queensland and RIRDC).
 - Design, develop and manufacture a fully automatic applicator to disperse 'Nalco' 'WaterSavr' product to limit surface evaporation in water.

- **Consulting Engineer to Bourgault Australia Pty Ltd**
 - Design, manufacture and testing of a Hydraulic Tine for Bourgault tillage range.
 - Design and test hydraulic system to operate Hydraulic Tine.

- **Consulting Engineer to Croplands Pty Ltd**
 - Design, model and manufacture Adjustable width Axles for Spray Coup Sprayer.

- **Consulting Engineer to Fieldquip Pty Ltd**
 - Design and model Three Point Linkage Bucket.
 - Design and model Three Point Linkage Grader Blade.
 - Design and model Three Point Linkage Slasher.

- **Consulting Engineer to the Department of Primary Industries, Toowoomba and Warwick**
 - Design, develop and manufacture a CO₂ measurement chamber.
 - Design, develop and manufacture a Hand Held plot harvester

- **Consulting Engineer to 'Saltbush Systems' Pty Ltd.**
 - Design, develop and test a one pass Saltbush planting machine.
 - Design, develop and test specialised machinery for on-farm saltbush nursery.

- **Consulting Engineer to 'Rainspan Irrigation', Toowoomba**
 - Structural and mechanical design.
 - 3D modelling and supply of manufacturing plans.
 - Testing and analysis of hydraulic efficiencies.
 - Design and development of an efficient drive system.
 - Operator manuals.
 - Continued technical support.

- **Consulting Engineer to 'Kenro Metal Services', Toowoomba**
 - 3D modelling and supply of manufacturing plans.
 - Structural analysis of general components.

- **Consulting Engineer to 'Namoi Valley Implements', Narrabri**
 - Supply of planter components.
 - Design, develop and test a parallelogram planting tine.
 - Design and construct a Control Traffic centre frame conversion for the Flexi-coil 820 Cultivator.
 - Supply manufacturing plans for the 'Bio-Blade' Disc Planter.
 - Supply graphical database for the 'Bio-Blade' Disc Planter.
 - Design a seeding boot for the 'Bio-Blade' Disc Planter.
 - Design and develop a precision disc-planting unit.
 - Design and develop a patented parallelogram/breakout precision planting tine.

- **Consulting Engineer to 'Agrowplow', Wellington**
 - Design and draft a folding 'Flexi-roller' structure.

- **Contract writing for the Kondinin Group's 'Farming Ahead' magazine, Perth**
 - Machinery evaluations and previews.
 - Technical support and assistance with research reports.

- **Consulting Engineer to ‘Gessner Industries’, Toowoomba**
 - 3D modelling
 - Structural analysis of toolbar frames

- **Expert Witness services in the Agricultural Industry, specialising in the following areas:**
 - Component specification analysis
 - Accident analysis
 - Structural failure
 - System failure
 - Data acquisition (Stress, Strain, Pressure, Velocity and Temperature)

Expert reports presented with the following optional aids:

- 3D computer solid modelling
- 3D computer animation
- Solid scale modelling
- Digital video
- Digital photography

Position: Design Engineer

Company: Orion Implement

March 1999 – April 2000

- Assisted in the development of a 245-kilogram-force spring tine mechanism.
- Designed and drafted chisel, cultivator and specialty tillage frames.
- Designed and built prototype front wheel castors for cultivator and chisel frames.
- Conducted in-field inspections of frame and tine performance to assist product development.
- Designed and fabricated a tine assembly table for rapid assembly.
- Design and fabricated jigs required for the fabrication of tine body.

Position: Product Development

Company: Flexi-coil (Aust.)

January 1998 – March 1999

- Testing of the Flexi-coil Seed Treatment Unit to determine dilution rates of Australian registered chemicals. Results were documented and published as a supplement to operator’s manual.
- Assisted the Service Engineer in troubleshooting mechanical, electrical, hydraulic and air system failures in all tillage and air seeding products.
- Designed and constructed test equipment for measuring comparative air velocity in primary hoses and visual aids for in-field trouble shooting of the seed metering system.
- Assisted dealers with customer pre-delivery of tillage and air seeding products.
- Designed and constructed the first 2-metre rear wheel kit for the Flexi-coil 1330 air cart to assist sales in the row crop market.
- Designed and constructed the first 3-metre front wheel kit for the Flexi-coil 20 series air cart to assist sales in the control traffic market.
- Designed and constructed an improved walk-beam mud scraper kit for the Flexi-coil 820 cultivator and 340 chisel ploughs.
- Write service reports for the Canadian head office (Engineering Department).

Position: Fitter and Machinist
Company: L & M Secombe Engineering

January 1990 – December 1993

- Mechanical repairs in the automotive, trucking, drilling and agricultural industry.
- Proficient skills were gained in the following areas:
 - Lathe and milling machining
 - Shaping and broaching
 - Heat treatment using through hardening and nitriding processes
 - Arc welding, metal inert gas (MIG) welding, tungsten inert gas (TIG) welding
 - Oxy-acetylene welding for applying nickel/manganese bronze and cast iron
 - Small to large fabrication

- Fabrication of row crop and broad-acre boom spray rigs.
- Machining of specialised hydraulic cylinders and components.
- Repairs to tillage frames and tines
- Fabrication of stainless spray tanks
- Fabrication and machining of specialised water drill bits.

Position: Maintenance Fitter (After Hours)
Company: Drillwell Construction

January 1992 – December 1994

- Responsible for the maintenance of two truck-mounted rotary drilling rigs. Duties included repairs to damaged equipment, hard facing of drill bits and repairs to drill rods.
- Designed and fabricated small structures.
- Slotting and welding bore casing.

Position: Assistant (Part Time)
Company: Janango Past. Co. (Family Property)

January 1984 – Current

- Assist in the design, construction and maintenance of machinery required for grain and feedlot operations.
- Cropping operations involving primary and secondary tillage in heavy clay black soil country.
- Planting of both summer and winter cereals.
- General animal husbandry duties involving cattle, sheep and fat lamb production.
- Hay production and milling of feedlot rations for sheep and cattle.

PUBLICATIONS:

Sulman R., Morgan M. *“Sintering of Aluminium-Ash Particulate Composite By Powder Metallurgy Technique”* Honours Thesis Report 1997.

Sulman, R & Kupke, P. (2006). *“Scoping Study of Hydraulic Yard Cleaning Methods”* National Centre for Engineering in Agriculture, USQ, Toowoomba.

KONDININ GROUP MACHINERY REPORTS:

- “John Deere 7020 series tractors” Evaluation report – November 2005, p22
- “Bombardier Traxter ATV” Evaluation report – October 2005, p12
- “New Holland TJ series tractors” Evaluation report – September 2005, p15
- “Amazone ZA-XW and ZA-M spreaders” Evaluation report – July 2005, p29
- “John Deere 9000 series tractors” Evaluation report – June 2005, p30
- “Agridry FB2000 grain driers” Evaluation report – May 2005, p18
- “Yamaha all-terrain vehicles” Evaluation report – April 2005, p29
- “John Deere 6020 series tractors” Evaluation report – March 2005, p13
- “Case IH STX Steiger” Evaluation report – February 2005, p10
- “MacDon 9352 series self-propelled windrowers” Evaluation report – January 2005, p9
- “John Deere 435 round balers” Evaluation report – October 2004, p32
- “John Deere 8020 series tractor” Evaluation report – August 2004, p26
- “Polaris Sportsman and Magnum all-terrain vehicles” Evaluation report – July 2004, p13
- “Daybreak disc opener assembly” Evaluation report – June 2004, p13
- “Victorian-built Sherwell Ahrens field bins” Evaluation report – May 2004, p6
- “Jaeschke field bins a hit with owners” Evaluation report – March 2004, p12
- “Janke trailing press wheel units” Evaluation report – February 2004, p26
- “John Deere 7020 series tractors” Evaluation report – January 2004, p16
- “Smale prickle chain harrow bar” Evaluation report – December 2003, p21
- “Lely Centerliner SL fertiliser spreader” Evaluation report – November 2003, p10
- “Grizzly and Field Boss disc plough” Evaluation report – September 2003, p22
- “Bourgault 8810 series cultivators” Evaluation report – March 2003, p16
- “Flexi-coil 20 series air seeders” Evaluation report – May 2003, p17
- “Bourgault 5000 series air seeders” Evaluation report – January 2003, p22
- “Ezee-on 2000 and 3000 series air seeders” Evaluation report – December 2002, p13
- “New Holland TM series tractors” Evaluation report – November 2002, p14
- “Ezee-on 3550 and 5550 series cultivators” Evaluation report – October 2002, p11
- “Massey Ferguson 6200 series tractor” Evaluation report – September 2002, p17
- “John Deere 8020 series tractor” Preview article- July 2002, p24
- “Kinze 2000 & 3000 series planters” Evaluation report – June 2002, p26
- “CVX adds infinitely variable transmission” Preview article – June 2002, p30
- “Gason Scaritill cultivator” Evaluation report – May 2002, p24
- “International 511 cultivator drill” Evaluation report – April 2002, p8
- “Fixing bolts to concrete” From the Workshop article – April 2002, p18 (co-author)
- “Tractors gain infinitely variable transmission” Preview article – February 2002, p9
- “Chamberlain 700 seed drill” Evaluation report – January 2002, p12
- “New Holland TS series tractor” Evaluation report – December 2001, p10
- “Selecting tools” From the Workshop article – November 2001, p14 (co-author)
- “John Shearer 3t and 5t air seeders” Evaluation report – October 2001, p14
- “Case MX Magnum series tractor” Evaluation report – September 2001, p24
- “Tests shed light on night work tools” Research report – August 2001, p10 (co-author)
- “Morris Concept 2000 cultivator” Evaluation report – June 2001, p32
- “Home made spray truck tailored to suit” Case study – April 2001, p14
- “Simplicity air seeder” Evaluation report – April 2001, p17
- “Janke Universal drill cultivator” Evaluation report – January 2001, p27
- “John Deere 9000T tracked tractor” Preview article – July 2000, p18 (co-author)
- “Cat Challenger E series tractor” Evaluation report – June 2000, p25 (co-author)
- “Horwood Bagshaw unveils new air seeder” Preview article – June 2000, p28