CMA

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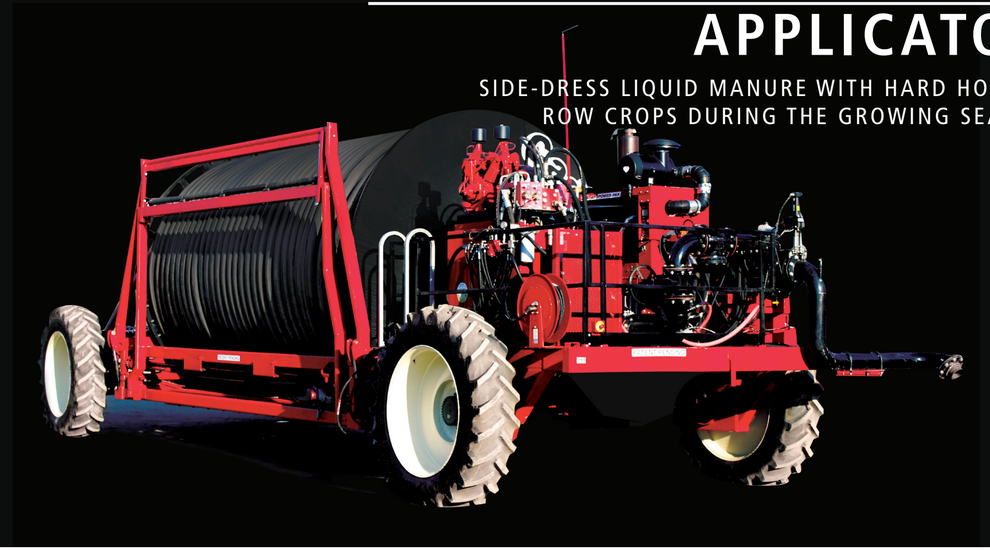
STRENGTH SIMPLICITY DEPENDABILITY

IT IS TIME TO RE-THINK YOUR MANURE APPLICATION

CMA
CONTINUOUS MANURE APPLICATOR

SIDE-DRESS LIQUID MANURE WITH HARD HOSE IN ROW CROPS DURING THE GROWING SEASON



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Cadman Power Equipment Ltd.
Box 100, 38 Main St.
Courtland, ON, Canada
1-866-422-3626
www.cadmanpower.com
inquiry@cadmanpower.com

STRENGTH
SIMPLICITY
DEPENDABILITY

GET THE MOST OUT OF YOUR MANURE WITH APPLICATION WELL INTO THE GROWING SEASON

CONCEPT BY ALIG, DESIGN BY CADMAN.

Cadman has taken a concept developed by the Alig brothers of Ohio to design and build the Continuous Manure Applicator (CMA). The CMA is engineered to apply liquid manure to growing crops by sidedressing, the CMA can apply manure in fields as long as a half mile.

The Alig brothers brought their patent-pending concept and four years of data collected by Ohio State University to Cadman Power Equipment. Cadman's expertise in engineering, design and manufacturing was a perfect fit with the science – the best time to apply manure is not in the spring and fall, but when the crops are growing.

"The CMA enables farmers to add manure during the growing season, which has proven to be a major advantage."
Wayne Cadman, President, Cadman Power Equipment Ltd.

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THE CHALLENGE OF NUTRIENT MANGEMENT

When planning your nutrient management strategy, there are a number of limitations to consider. The big question is:

"How do I fully utilize the value of the nutrients in manure while reducing the overall cost of application?"

There are many considerations such as liability, cost, storage and more. The current methods, which include tankers – or soft & hard hose drag systems, each have many pros and cons associated:

Current Methods

Tankers

- Increased compaction
- More tractors
- More labour

Soft Drag Hose

- Limited application window
- Less life expectancy
- Smaller field sets

Cadman Hard Hose Method

- 10x more life than soft hose
- Less compaction
- Fewer tractors
- Fewer labour hours per gallon
- No twisting or knotting
- Longer application window
- Larger field sets
- Overall cost per gallon is less

Continuous Manure Applicator - For side dress in row crops

BEST MANURE MANAGEMENT PRACTICES

Public concerns have increased the pressure on farmers and custom pumpers to meet best manure management practices (BMP) to improve the most effective use of manure on the soil.

Regulatory issues vary in every jurisdiction, and are constantly changing. Only being able to apply during a specific time period increases the requirement for manure storage. Solids settling will reduce the nutrient value stored in manure, decreasing your potential for yield increase. The loss of nutrient value when applying manure pre– and post– crop necessitates the use of commercial fertilizers. Other methods can potentially cause compaction and runoff.

These challenges are universal and have helped inspire the design and creation of the CMA.

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Continuous Manure Application - For side dress in row crops

A REVOLUTION IN NUTRIENT MANAGEMENT TO IMPROVE YOUR BOTTOM LINE

CMA DOES IT ALL

- Row Crop Application, Irrigation, Traditional Drag Line and Boom Application

APPLY THROUGH CROP CYCLE

- Application before, during and after the growing season

INCREASE YIELDS

- Increase yield by 7 – 15% when fertilizing with the CMA. Rapid payback for both farmers and custom operators

KEEP TANKERS OFF THE SOIL

- Stops compaction by using hose instead of tankers and applying when the soil conditions are fit

REPLACE SYNTHETIC FERTILIZER

- Use of the natural nutrients in manure allows you to forego the use of synthetic fertilizer

CUSTOMIZE TO YOUR FIELD SIZE

- Apply in a field up to 1/2 mile (800 m) in length; or, customize hose diameter and length to your needs when ordering

REDUCE LABOUR COSTS

- One-person operation, via the computer control system. Lowering the cost of labour

EFFICIENTLY USE MANURE

- Increase utilization of nutrient contents of manure by applying where and when the crops need the nutrients most. Introduce biomass and organic matter into the soil through injection

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Payback calculations are based on total acres applied, as well as the nutrient content of the manure vs. application rate.
Please contact your Cadman rep for a complete payback evaluation.

UTILIZING THE BENEFITS OF YOUR MANURE HAS NEVER BEEN EASIER

The CMA generates a larger time window for spreading liquid manure, allowing you to spread via side-dress, during the row crop growing season. The most recent research has proven that the CMA can generate more profits by utilizing the nutrients in manure (N, P & K) while the crop is growing.

At the same time, public concerns are minimized by utilizing incorporation instead of spraying of liquid manure. Runoff is reduced, nutrient utilization is increased, and concerns from neighbours about smell, and wider concerns about runoff and the environment are reduced – along with your risk of expensive fines. Incorporation with the CMA introduces a new and innovative method to meet current and upcoming regulations.

With government agencies pushing to limit fall application on post-harvest soil, storage capacity is expected to increase to allow for a longer timeframe before the spring spreading season begins. By using the manure during the growing season, the CMA allows you to keep a manageable amount of storage; which is exactly what you need to make the best use of the nutrients in the manure. The loss of nutrient value when applying manure pre- and post-crop, necessitates the use of artificial fertilizers. The ground impact of applying liquid manure is reduced with the CMA. Compaction is limited by using only a tractor and incorporation toolbar, pulling a hose. CMA allows you to apply liquid manure during the crop growing season up to 3 – 4'.

INNOVATION, WITH THE FUTURE IN MIND

APPLICATION EFFICIENCIES

Reduced Compaction

- Eliminate heavy tankers on the field
- 1 – 4+ weight difference between Cadman injector and tractor VS. tractor and large tanker going up your field
- Complete in 1 continuous pass
- No fertilizer equipment needed
- No cultivating needed
- Limiting trafficked acres by utilizing a 40' (12 m) injector or 60' (18 m) dribble bar

All Season Machine

- Application period increased by at least 2 months
- 1,100 – 1,200 gals/min (4,545 l/hr) continuously, up to 72,000 gals/hr (2,72550 l/hr)
- Try to reduce the need for fall spreading, reducing run-off

Spring Application

Summer Application

Fall Application

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HOW DOES THE CONTINUOUS MANURE APPLICATOR WORK?

Incorporate your liquid manure after planting to see tremendous yield increases, in row crop up to 4' tall.
Apply via side-dress with minimum compaction and damage to plants with the all new...
Cadman Continuous Manure Applicator!

CMA Injector – Pull Out Cycle

1 The tractor pulls the injector with the patented CMA swivel arm. The arm pulls out the 5.5" (140 mm) I.D. hard hose away from the CMA and incorporates in 30' (9 m), or 40' (12 m) width rows.

CMA Injector – Swing Arm

2 When the tractor gets to the opposite end of the field (up to 1/2 a mile (800 m)), the tractor turns 180° and comes back down the field, incorporating another 30' (9 m) and 40' (12 m) strip. When the tractor turns, the swing arm turns to the side of the tool-bar, which keeps the hose in the same row it was pulled out on.

CMA Injector – Retrieval Cycle

3 The tractor returns at the same speed it is pulled out. Tractor ground speed on the return trip is synchronized with the rate of speed that the CMA rewinds the hose.

CMA Injector – Advanced Turn

4 The 4WD CMA reel and steering is controlled remotely from the applicator tractor cab. While the operator is completing his return trip, the remote automatically moves the CMA forward another 60' (18 m) or 80' (24 m) in order to start another pass.

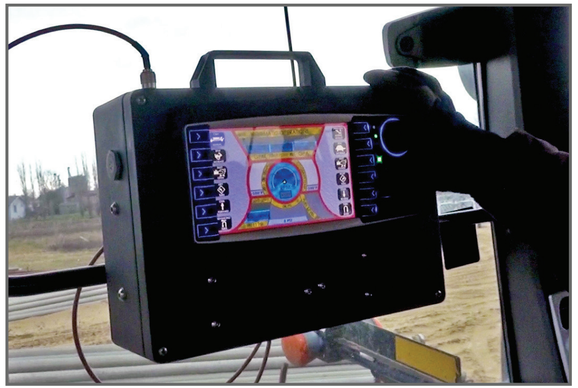
COMPUTER CONTROL SYSTEM

CMA Remote - Control the CMA remotely from the comfort of the tractor cab, allowing for one – man operation.

The remote controls the following:

Functions Include

- Advanced turn cycle
- Turn back cycle
- Ramp engine RPM up or down
- Disengage and engage clutch for pump – set for automatic or manual
- Open and close inlet valve in pump – automatically or manually
- Drive and steer the machine
- Move stabilizer feet up or down
- Reel in hose
- Displays all engine, pump and flow telemetry



Continuous Manure Applicatior - For side dress in row crops

CMA SWING ARM

The patent pending Cadman swing arm is uniquely built to work with the CMA reel. The equal length arm includes a controllable pivot wheel at the end of the arm in order to keep the hose in the crop row. Once the hose is aligned in the row, simply put the wheel in float and let the Cadman swing arm do the rest of the work.

The arm is attached to a heavy-duty pivot that allows for steep grades on the land. As well, it is conveniently placed to allow for clearance over tall crops such as corn.

Once finished with the machine, the arm can be folded behind the injector for easy transport to the next job.

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OPTIONS:

- Arm length for 30′ (9 m)
  - Injector: 32′ 6″ (10 m)

- Arm length for 40′ (12 m)
  - Injector: 42′ 6″ (13 m)

Continuous Manure Applicatior - For side dress in row crops

CADMAN INJECTORS

Highlights

- All CMA machines come standard with a 30’ (9 m) three-point hitch injector
- Folding wing design to allow for a convenient transport width of 11’ 11” (3.6 m)
- Standard spacing is 30” (76 cm)
- 30’ (9 m) and 40’ (12 m) models available
- Built in Vogelsang ExaCut Distributor
- 2D Conventional grade control
- Blow-out ball catcher

Options

- Galvanized wings and frame
- Krohne Flow Meter
- 6” (15 cm) or 8” (20 cm) Plumbing
- Tooling options included:
  - AerWay® tines
  - VTI injectors
  - Dietrich injectors
  - Yetter, etc

CADMAN BOOMS

B40 3 Wheel Boom

- Boom length: 131’ (40 m)
- Line spacing: 131’ – 200’ (40 – 61 m)
- 3-wheel mounted boom allow lane spacing of 59’ to 200’
- For ease of operation the booms are transported on the reel and a fixed hydraulic lift system has been developed to transport the booms safely
- Accurate and uniform water distribution under a wide range of conditions, with a controlled droplet size to match the crop
- The booms operate at low pressure (9 – 60 PSI) and can apply from 61 to 220 GPM.

B64 4 Wheel Boom

- Boom length: 210’ (64 m)
- Line spacing: 210’ – 300’ (64 – 91 m)
- Efficient, tough, reliable and versatile
- Easy to operate, can be folded by one person for transport
- Uniform water application gives more even crop growth compared to big-gun systems
- Can reduce water consumption by 20% compared to big-gun systems
- High flow rates allow faster retraction enabling large areas to be covered in less time

VOGELSANG BACKPAC

Highlights

- Highly precise distribution with a dual symmetrical hose arrangement
- Transport position following the tractor
- Remote unlocking and folding of the side arms
- Mounted in a 3-point design
- The stable supporting frame can handle strong tension
- Evenly spaced lines of spread manure from the drain hoses promote optimum growth
- No additional accessories required for the tractor.
- EasyPack pre-installation

Options

- DropStop with the CFC hose shut-off
- Sectional shut-off
- Oscillation compensation – starting at 60’ (18 m)
- The system is folded up semi-hydraulically
- 50’ (15 m) & 60’ (18 m) models available

CMA SPECIFICATIONS

Standard Features

- Engine driven (manure) boost pump to provide for consistent high-volume flow of the manure
- Four hydraulically powered drive wheels with steering capability on the front axle. The hose drum will be driven hydraulically
- Computer Control System (CCS) – operational control: inputs, status outputs, engine monitoring and functional control inputs and outputs, radio remote control system activation/deactivation an application data during operation, with emergency shut off – engine start/stop, rpm increase/decrease and engine gauges at the machine chassis
- Flexible supply hose will supply manure from its source
- Open inlet valve and engage pump clutch when the PE hose is pressurizing and all air purged from pipeline
- Start Application – engine ramps up RPM, when at desired pressure, the operator will start to pull the PE hose off the drum and start to apply manure to the field
- Rotary angle sensor – determines which 3 layers of hose is being used, at what rate RPM, prevents hose tangle – will lock drum

- Drive circuit provides sufficient drag to keep hose tight
- Brake pressure will be operator controllable from the radio remote control
- Drum drives are hydraulic release as a safety feature, which locks the drum
- Press the turn back button and begin to turn into your next row
- Retrieval rate rewinds the PE hose at the same linear speed it was pulled out
- Advanced Turn – CMA moves forward to the next row, which is programmed into the CCS
- Motor braking circuit pressure – Preventing loosening of PE hose – coordinating the braking systems with the drum drive is to never allow the PE hose coil to loosen on the drum, causing potential issues with coiling of the PE hose or the ability to reload all the PE hose back onto the drum
- Emergency shut-off
- Close inlet valve, stop engine and power source
- Ball launcher hardware is incorporated into the main manure pump plumbing of the CMA machine to facilitate loading and launching the clean-out ball
- Speed matches gallons per acre on retrieval to leave consistent nutrient application

Radio Remote controlled functions
(via Operator Control Module):

- Engine – start, stop
- Engine – RPM increase, decrease
- Travel Speed – 0 – 100%, proportionally controlled
- Parking brakes – release
- Chassis Steering – left and right, proportionally controlled
- Drum brake release/apply – proportionally controlled (for drag adjustment during operation)
- Drum rewind – proportionally controlled
- Stabilizer – extend, retract, proportionally controlled, with auto-stop at pre-set pressure
- Main (manure) pump clutch – engage, disengage
- Main (manure) pump inlet valve – open
- Tongue – raise/lower

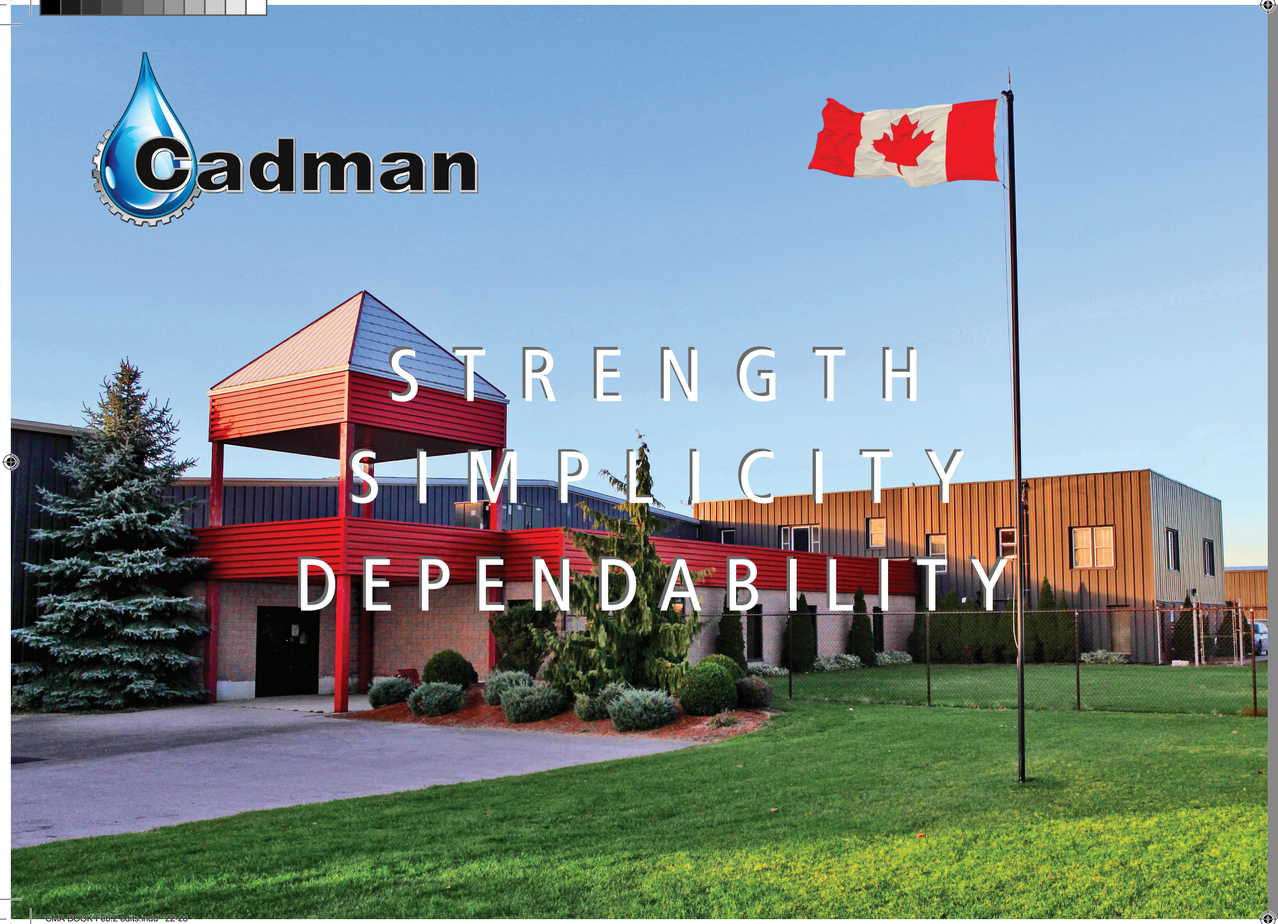
CMA SPECIFICATIONS

Mechanical Specifications

- Overall length – 46’ (14 m)
- Overall operating height – 13’ 5” (4.1 m)
- Overall transport width – 11’11” (3.4 m)
- Wheel base – 34’ 6” (10.5 m)
- Track center – 120” (304.8 cm)
- Inside diameter 5.5” (14 cm) x Hose 2800’ (853 m) long
- 375 HP (281 kw) John Deere engine
- 4NHTB Cornell pump
- Tires - 480 x 80 x 50

- 3 – position hose guide extension
- Automated hose guide extension lift
- Twin 115 HP hydraulic pumps
- High – speed drum drives with wet clutch
- Fuel capacity 250 U.S. Gallons (946 L)
- Hydraulic tank capacity – 150 U.S. Gallons (568 L)
- Flow of manure up to 1235 U.S. GPM (4675 L/min)
- 4 – wheel planetary hydraulic drives with quick disconnects for towing

- Max travel speed – 4.5 mph (7.2kph)
- Max tow speed – 25mph (40kph)
- Max hose retrieval speed - 4.8 mph (7.7kph)
- Dual purpose stabilizers are used for easy loading & unloading of the machine for long distance transport on trucks
- Tongue – heavy duty with pintle hitch and safety chains for towing the CMA behind a tractor
- Brake for hose – utilized to control the hard hose during the retrieve and pull out cycles



Innovation and invention are in our blood.

Cadman Power Equipment has been working with farmers to increase their bottom line for three generations, since 1952. Staying true to our roots, we pride ourselves on the strength, simplicity and dependability of all our systems.

It all started with the design and manufacturing of a reliable line of irrigation travellers that provides farmers with a simple method of delivering large volumes of water to their crops more easily, quickly and efficiently than ever before. To expand our agricultural offerings, Cadman propelled itself into nutrient/manure management systems to enable customers to move heavier, denser liquids for longer distances. We have expanded our product line into industries including: oil and gas, emergency response, municipal and more with our high volume fluid transfer systems. Cadman is now taking nutrient management to the next level, by introducing the Continuous Manure Applicator (CMA), which allows you to apply liquid manure to row crops multiple times during a growing season.

Irrigation

Manure Management

Fluid Transfer