

Agriculture, big business and the gas fields: practical tools for weed hygiene at the mega-scale

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Summary The coal seam gas industry is big business in Queensland. A rapidly expanding network of gas fields, wells, pipelines and power lines criss-cross private and public lands. Constructing, operating and maintaining this infrastructure requires thousands of associated vehicle, equipment and personnel movements across property boundaries every day. These activities have the potential to be a significant source of weed seed spread, both within the local area and further afield.

So what do we do when weeds threaten not just the livelihoods of those on the land but also the reputation and bottom line of those in big business? And what role could preventative measures play in controlling weed spread at this mega-scale?

Land managers from agriculture and big business alike are now turning to weed hygiene as a way to protect their interests. This paper provides an insight into the coal seam gas (CSG) industry's approach to weed hygiene and demonstrates how practical measures can be applied to prevent weed seed spread.

Keywords Weed hygiene, weed seed spread, biosecurity management, agriculture, natural resources sector, coal seam gas industry, clean and inspect machinery hygiene.

INTRODUCTION

Weeds have significant economic, environmental and social impacts. Machinery and vehicle movements present a critical weed dispersal pathway and even small vehicles can carry up to 400 viable weed seeds (Adkins 2013). The situation is further compounded by the characteristics of serious weeds, such as parthenium (*Parthenium hysterophorus* L.) and weedy sporobolus grasses (*Sporobolus* spp.) that allows them to be easily transported over long distances.

Preventing this spread is one of the most effective forms of weed control. At the local property level, landholders implement a variety of measures to prevent weed spread and protect their productivity and economic returns: vehicles and equipment are regularly cleaned; landholders insist that seed stock and fodder are accompanied by weed hygiene declarations or that they are free from weed contamination at the time of purchase; strict quarantine procedures are

followed before new livestock are introduced; pastures are maintained in good condition to prevent weed emergence and crops are sprayed or tilled.

However, weed hygiene has an even more significant role to play where agriculture and big business intersect. Within Queensland's coal seam gas industry, there are over 5000 active wells (APPEA 2013) and over 4800 land access agreements (Broome 2014). The Australia Pacific Liquefied Natural Gas Project has focused on developing gas fields in the Surat and Bowen Basins in south-west and central Queensland. The project has also been responsible for the construction of a 530 km gas transmission pipeline, as well as associated production and water treatment facilities. There are another three gas proponents undertaking projects of a similar nature in the same area.

At this mega-scale, activities involve thousands of vehicle, equipment and personnel movements across property boundaries every day. With this level of activity, controlling the spread of weeds across dispersed and often remote locations, creates a significant challenge for the CSG industry and the wider community.

The response to this challenge has included the introduction of a number of regulatory requirements, codes of practice and land access agreements as well as increased training and awareness, practical control measures (including wash-down and weed hygiene inspections) and collaborative solutions. Weed hygiene has evolved as a critical risk management tool as companies begin to understand the threat weeds present to their legislative compliance, reputation and bottom line.

EVOLUTION OF WEED HYGIENE IN QUEENSLAND

Within Queensland, the *Land Protection (Pest and Stock Route Management) Act* 2002 has been instrumental in driving social change and promoting improved weed hygiene practices. In 2010, the Queensland Government responded to the increasing need to manage interactions across the natural resources sector by developing the Land Access Code. The Code applies mandatory land access conditions and weed hygiene requirements to all resource permits issued in Queensland, further promoting weed hygiene

and minimising the risk of weed seed spread onto agricultural lands.

Major CSG projects now have extensive environmental approval conditions that they must meet. These changes have prompted an increased awareness of weed hygiene across the wider CSG industry as companies share their commitments with staff, contractors and suppliers.

THE WEED HYGIENE CHALLENGE

The coal seam gas context Establishing a new coal seam gas well is a lengthy process. Wells are generally located on private property and dotted across the landscape where the best reserves can be accessed. The construction phase generally involves an exploratory period followed by development of a gathering network that links gas wells to the gas processing plant. Once construction is complete, operation, extraction and maintenance activities commence. Over the life of the well (some 20 to 30 years), each site will be visited by earthmoving equipment, drill rigs, maintenance contractors and hundreds of small vehicles.

Industry challenges Logistically, wash down is often required in remote locations with few publicly accessible facilities. The size and volume of equipment further complicates the task of washing down in the field with equipment ranging from small vehicles through to large complex drilling rigs. Companies then need to address facility construction and maintenance tasks, water usage charges, labour associated with the wash-down as well as equipment stand-down issues. Hence, weed hygiene measures are often perceived as increasing short-term costs and reducing productivity.

APPLYING WEED HYGIENE

Despite these challenges, agriculture and big business are implementing a range of practical weed hygiene measures to protect their interests. These include policy and planning initiatives; land access agreements; training and awareness; practical control measures; auditing and review; and a variety of collaborative solutions.

Policy and planning To tackle the legislative and operational risks of weed spread throughout their operations, some gas proponents have developed comprehensive biosecurity management plans and hygiene procedures. This approach generally confirms the company-wide biosecurity management activities and assists companies to implement biosecurity measures consistently throughout their operations. Companies focus on managing known biosecurity issues on their properties and ensuring that vehicles and equipment

are free from potentially harmful animal, plant and soil material throughout the entire logistics chain.

Thorough planning and survey works are used to support the development of effective biosecurity management plans. Detailed baseline surveys help to establish the known weed liabilities of a site prior to the commencement of works. The baseline data can be used to inform specific management requirements within disturbance approval permits, site management plans and targeted works programs. It can also serve as evidence should a weed management dispute arise with a landholder.

Land access agreements Mutually established landholder agreements are critical to operations within the coal seam gas industry. These plans are currently developed on a case-by-case basis and there is little consistency across companies and between landholders. Some landholders seek legal support to ensure that their biosecurity requirements are appropriately addressed before permitting access to their properties. Often the CSG company reimburses the costs incurred by the landholder in regards to legal advice.

The more effective agreements tend to include a wide range of issues such as an agreed list of existing weed liabilities prior to the commencement of works, detailed clean down protocols, an agreed monitoring and action plan for the long term and dispute resolution procedures in the event that something goes amiss during the term of the agreement.

Training and awareness To effectively manage weeds at the operational level, there must be clear prevention and control procedures. Within the gas industry, most companies implement specific hygiene procedures to ensure that their staff and contractors are fully aware of their wash down obligations. Procedures generally outline the legislative and operational requirements for weed hygiene, provide instructions on when vehicles and equipment must be cleaned and inspected and outline the requirement for the management of weed hygiene documentation.

The more proactive companies maintain hygiene standards by training authorised inspectors to understand biosecurity risks and apply consistent inspection and cleaning techniques. Nationally accredited training, such as the competency AHC BIO201A 'Inspect and Clean Machinery of Plant, Animal and Soil Material', helps companies to set consistent hygiene standards and ensure that their staff and contractors are aware of the relevant biosecurity policies and procedures.

Once training is successfully completed, and qualifications issued, the authorised inspectors are

deemed competent to issue a Company Hygiene Inspection Report, declaring that the vehicle or equipment has been inspected and is visually free from weed reproductive material. With thousands of authorised inspectors trained within Queensland's gas industry every year, the cleaning and inspection of vehicles and equipment has become a key compliance requirement for CSG operations.

Practical control measures Wash downs and hygiene inspections have become the front line of defence against the spread of weeds. The gas industry accesses a network of public and private wash down facilities throughout Queensland. They have also built permanent wash down facilities at their major sites and use mobile facilities to support remote operations. These facilities range in complexity from simple concrete pads with a hose, through to state of the art, high-pressure recycled water systems which are designed for high-volume use. Authorised inspectors (either internal or third party) check vehicles, equipment and loads for potential contaminants before they are moved between sites.

To reduce the risk of weed seed spread, gas companies also establish movement corridors to concentrate vehicle movements. This allows weed and pest issues to be more effectively monitored and controlled. Once a declared weed issue is identified within the area of operations, a management plan is generally developed. 'No go' areas are often identified and operators are encouraged to work within clean areas prior to weed infested areas, limiting the exposure to weed outbreaks wherever possible. Control measures are implemented to contain and manage the infestation. Like most weed control activities, the effectiveness of the program is largely dependent on the quality of the strategy and the consistent application of resources to achieve its aims.

Auditing and review Within companies with established biosecurity procedures, company environmental staff audit the hygiene process internally whilst external auditors are often used to conduct annual audits for gaps or deficiencies in the systems. Developing robust weed hygiene practices has enabled a wide range of companies to minimise the risk of weed seed spread throughout their entire operations.

Collaborative solutions Recognising that pests don't stop at the property boundary, some companies are beginning to develop a more community based approach to weed management. Origin Energy has developed property pest management plans for each of their own property aggregations and are also involved

in coordinated neighbourhood control programs. Some gas companies have begun to see the value in assisting landholders to establish on-farm wash down facilities, such as the Santos grants program being administered through the Queensland Murray-Darling Committee.

Collaborative solutions are also being forged as industry groups come together to focus on weed management issues. The Onshore Gas and Agriculture Weed Seed Management Steering Group is comprised of representatives from government, gas companies, infrastructure providers, the Queensland Gasfields Commission and AgForce. The Group has already been responsible for ensuring greater communication within the industry on weed related issues and for developing a farm biosecurity plan, company hygiene documents, data sharing arrangements and auditing processes to check best practice management (Gasfields Commission Queensland 2014).

CASE STUDIES

Win-win with mutual agreements A number of companies and landholders are now working together to successfully implement practical weed hygiene measures. The landholders at a private property, near Wandoan in Queensland, worked with a coal seam gas company to ensure that they could protect their property from unwanted impacts.

Gas exploration and extraction activities commenced only after a detailed agreement was developed between the landholder's lawyers and the company legal team. A pre-entry survey was completed across all access routes and work sites and strict on-farm hygiene requirements were clearly documented. The agreement is carefully monitored and to-date activities have occurred without dispute.

Procedures protecting interests A similar arrangement has been developed at Esher, near Westwood in Queensland. In addition to the detailed land access agreement, the landholders provide contractors with a range of information to aid awareness about the weeds that are of particular concern to their properties.

Biosecurity signage has been erected at all entry and exit points and all vehicles and equipment are carefully inspected by the landholder's representative prior to accessing the property. Quarry materials are carefully screened prior to delivery and only procured from weed free sites within the local area. Livestock is only purchased from known sources with low weed risks and they are quarantined in a holding paddock for up to 7 days upon arrival at the property. Finally, the property tracks are kept free of declared weeds through regular monitoring and spraying activities.

CONCLUSION

When it comes to weed management, there is no doubt that prevention is better than cure. Weeds threaten the productivity and economic sustainability of our agricultural sector, as well as the legislative compliance, reputation and bottom line of big business. Weed seed spread can readily occur across property boundaries. Where the activities of agriculture, big business and the gas fields intersect, the scale and complexity of these interactions presents a serious management challenge for all involved.

Current industry responses to the threat of weed seed spread include policy and planning initiatives, land access agreements, training and awareness as well as a raft of practical tools including wash downs, weed hygiene inspections and on-ground control programs. However, there is still much to be done to ensure that both landholders and big business can protect their interests from the threat of weed seed spread and the broader biosecurity issue. A renewed commitment to long-term collaborative solutions ensures that the role of weed hygiene will continue to evolve.

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