



# Australian Brumby Alliance (ABA)

## Brumby Resource Information-5.2

[www.australianbrumbyalliance.org.au](http://www.australianbrumbyalliance.org.au)

### **Overview of Wild Horse Fertility Control**

#### **Introduction**

Australia's zoos use fertility control, and research continues on Australian marsupials, BUT the only source of documented fertility control trials on Wild Horses, delivered by dart gun, comes from the USA and, more recently, England. Australia's first fertility control field trial for Brumbies began early 2015 by *Save The Brumbies* (NSW) and their report is due in 2017.

#### Acknowledgements

*This Australian Brumby Alliance (ABA) information paper includes details on fertility control from A. Bassett's report for the "Dartmoor Hill Pony Association" where fertility control is being trialled on ponies living wild on Dartmoor National Park, England. Parts of Sandy Radke's previous fertility control information have been retained and its contents reviewed by ABA members.*

Since 2009 the ABA has encouraged Australia to trial immuno-contraceptive fertility control (modelled on North American Mustang programs) because of its potential to add another humane option to managing Brumby populations. Until fertility control trials are researched under Australian conditions we cannot say precisely how they can assist humane Brumby management, but *until trials being here, we'll never know*; and the Brumbies meanwhile remain hostage to shoot-and-shoot-again policies. The ABA has one member group with the ability to manage remote darting field trials at a cost under 5% of the NSW NPWS quoted (2014) \$1074 per Brumby trapped – but to date, we still wait for interest in this option.

#### **Why is it an important management option?**

If less foals are conceived through fertility control, the potential number of Brumbies needed to be removed is lowered and the social mobs will not have to suffer the trauma of mass culls. For this reason, it is essential we progress Australian fertility control trials now and learn how to most effectively use fertility control in a range of Australian environments that can offer a safe, cost effective *option*, to humanely stabilise sustainable Brumby population levels.

The USA has used fertility control, for over 30 years on Mustang populations. If this option is adapted to Australian conditions, numbers to trap could be lowered, rehoming groups will be more likely to keep up with trapped rates and fewer Brumbies will be killed; a win-win result.

#### **Where is it used?**

American Wild Horses, known as "Mustangs" are treated with fertility control vaccines on many sites across the USA, *including*; Assateague Island National Seashore, Sand Basin, Carrot Island in North Carolina, Return to Freedom Wild Horse Sanctuary (California), Little Book Cliff National Wild Horse Range (Colorado) and Pryor Mountain Range (Montana), Cedar Mountains and Wyoming (McCullough Peaks Herd Management Area). More recently fertility control trials are being conducted on England's moorland ponies.

## Applying Fertility Control by Dart Gun

### ***Vaccine delivery***

Both PZP (Porcine Zona Pellucida) and GnRH (Gonadotropin Releasing Hormone) can be applied by dart gun, an important requirement for Australia's free roaming Brumbies as this eliminates the need to trap first, which is both useful in terrain where trapping is problematic and opens up a flexible, practical way to apply fertility control on Wild Horse populations.

When the dart hits the horse, a tiny explosive charge then injects the fertility control into the mare and ensures the dart is also self-ejected (important for welfare reasons), and at the same time marks their coat with a water resistant paint.

The ideal range on the rifles is 60 – 100 yards to dart a horse for fertility control. The distance for each shot must be accurately set once the shooter has the horse located in an area that will allow the dart, which self-ejects, to be retrieved. It is vital the distance is precise because if the gun is set too close for the correct pressure the dart will penetrate too far into the mare and if too far for the pressure set, the dart will bounce off without penetrating or drop short.

Darting requires patience. Often, shooters in America focus on one group each day, watching to see where they are heading so they can wait for the mob to graze closer. The rifle is quiet as it is pneumatic (much like a paintball gun). Other techniques include waiting until a mare is walking past scrub or near another mare so that the target mare thinks the prick is from a thorny bush or a nip from another mare. Australia needs to develop its own unique methods.

### ***Costs***

- Vaccines cost around \$30-\$35 per dose, depending on type.
- The dart gun is expensive, ranging from \$5 to \$10 thousand dollars approximately, however the darts are re-usable.
- Volunteers can be trained to use the dart gun and collect details prescribed by research program controls, only costs would be travel cost reimbursement for agreed site visits.

**Costs to dart a Brumby are only 5% of the \$1,074 quoted by NPWS [website] to trap a brumby.**

### ***Who gets darted?***

The mares are treated as that is the only way to control the numbers of foals born to wild populations. If stallions were targeted, any non-treated stallion will seek any mare in season.

### ***Modelling Fertility Control Application***

The number and age of Brumby mares selected, as well as frequency of vaccinations will vary depending on what is required to stabilise the population at a viable, sustainable level. The modelling formula should also aim to maintain as broad a genetic base as possible by ensuring all mares have the opportunity to produce at least one foal. An example model could be to dart young adult mares, so they have time to fully mature before foaling, and the more senior mares that have produced foals.

Like any method, fertility control should be part of a 'tool bag' to use where appropriate. The role of fertility control is to assist in stabilising a viable, sustainable Brumby population – *never, ever, for total eradication.*

## **Comparison of two Fertility Control Vaccines used for Remote Darting** **- PZP and GnRH (GonaCon)**

### ***How do they work?***

**Porcine Zona Pellucida (PZP immuno-contraceptive)** - In simple terms, this is like putting superglue in a lock. To fertilise an egg, sperm must first bind to the egg's membrane before penetrating it. A mare injected with PZP will produce antibodies that stop sperm from binding to the membrane, thus preventing fertilisation and pregnancy.

**Gonadotropin Releasing Hormone (GnRH immuno-contraceptive)** - Normally GnRH is produced during the reproductive cycle to release Gonadotropins which in turn signal the ovary to release eggs for fertilisation. GnRH *contraception* produces antibodies that bind to the mare's naturally circulating GnRH, interrupting the cycle and the release of eggs, making them unavailable to male sperm.

### ***How are they produced?***

- PZP is derived from pig ovaries (in abattoir waste), hence the name *porcine*.
- GnRH vaccines (*Equity* in Australia) can be produced synthetically, unlike PZP.

### ***How long do they work for?***

- *Multi Year, Single Shot PZP vaccine (Spay Vac and Polymer pellets)* PZP can be mixed with various polymers to form a pellet which is injected into the mare and, like 24 hour cold and flu tablets, the polymer releases the vaccine over time, thus enabling multiple year treatments in one shot administered by remote darting or injection. *Spay Vac* uses liposomes in conjunction with PZP to extend effectiveness for up to 4 years.
- *Equity and Improvac* are delivered as two doses. The 2<sup>nd</sup> dose is given 4 weeks after the initial dose and causes the mare's ovaries to resemble those of a mare outside the breeding season 4 weeks after the second dose. A reduction of typical male behaviour, such as mounting and aggressiveness, is normally found after the second dose.

### ***Return to foaling***

Both PZP and GnRH have been used in trials where reversibility was demonstrated. However, mares treated with PZP take longer to return to normal cycling behaviour and research shows that some mares will never regain fertility after repeated PZP treatments.

### ***Already pregnant horses***

PZP and GnRH trials in wild animal populations show that mares already pregnant when treated have no specific side effects or increases in abortion rates.

### ***Natural food chain***

Both PZP and GnRH have been used in many long term studies in a variety of different species. No effects within the food chain were reported.

### ***Injection site reaction***

Both PZP and GnRH produce a degree of injection site reaction based on the adjuvant used, rather than the active treatment ingredient. Research shows an injection site reaction may not be apparent by visual examination, but can be palpitated. The water-based GnRH product *Equity* seems to show lower levels of injection site reaction or no injection site reaction. It was also noted that reactions may be exacerbated by extra impact from remote darting.

### ***Social behaviour***

PZP prevents pregnancy but allows the normal oestrus cycle to continue which can lead to social behaviour problems, such as:

- PZP can extend foaling into what is normally the non-breeding season;
- An increased rate of stressful harassment and aggression can lead to a break down in social ties in harem groups;
- Treated mares can visit or change groups more often than untreated mares; and
- Body condition was the strongest predictor of different feeding, resting, maintenance, and social behaviours. No difference was noted in the body condition of treated versus control mares; however, they did note that mares with foals had lower body condition.

GnRH prevents the mare going into oestrus and associated breeding behaviours, but does not appear to disrupt social behaviours in their groups. It was noted that GnRH treatment merely prolonged the lack of sexual interest throughout the year versus exhibiting breeding behaviour for around six months out of the year.

The ABA has advocated for fertility control trials on free roaming Brumbies in National Parks since we held the first Wild Horse specific fertility control seminar in Brisbane (2009) - Instead the shoot and shoot again policy continues – shooting must end and fertility control started to lower the foaling rate to a level that all Park trapped Brumbies can be successfully rehomed.

### ***Australian fertility control trials are needed***

Fertility Control can provide humane management of wildlife and some fertility control research for wild species is funded in Australia. However, Australian authorities remain reluctant to fund programs for managing wild horse populations. Fertility control vaccines and delivery options have improved significantly since first used, and knowledge of where, how and when to apply fertility control trials to wild Brumby populations is available *now*.

The risk of fertility control being used to eradicate Brumby populations will require all National Parks and their agencies be transparent when using such programs to the community, partner with relevant Brumby Advocates in program planning and expert review committees, and affirm often that fertility control will only be used to retain viable, sustainable wild Horse populations.

### ***The ABA's position***

ABA accepts that wild horse populations should be managed to a viable, sustainable, level and advocates for humane non-lethal controls. While current fertility control treatments are not suitable for all wild horse populations, the ABA believes that there are areas of Australia where these methods can be applied *now* and studied as trials within Australia's environment. In this way, Australia will both develop skills to apply fertility control program and add a cost viable option to complement other humane, non-lethal Brumby management strategies.

If Australia as a nation is not prepared to try and improve the efficiency of Fertility Control through research and development, the cycle of ground and aerial shooting will continue with far too little management in between, allowing population numbers to again increase until it becomes necessary to shoot again, and then again.....

Australian Brumby Alliance 11-March-2016

## References and Links

Ballou, Johnathan D., et.al., 2008, Simulation model for contraceptive management of the Assateague Island feral horse population using individual-based data, *in Wildlife Research*, V35, 502-512, CSIRO Publishing

Botha, A.E., et.al, 2008, The use of GnHR vaccine to suppress mare ovarian activity in a large group of mares under field conditions, *in Wildlife Research* v35, 513-519. CSIRO Publishing

Killian, Gary, et.al., 2008, Four-year contraception rates of mares treated with single-injection porcine zona pellucida and GnRH vaccines and intrauterine devices, , *in Wildlife Research* v35, 521-539. CSIRO Publishing

Kirkpatrick, Jay F., and Turner, Allison, Achieving population goals in a long-live wildlife species (*Equus caballus*) with contraception, 2008, *in Wildlife Research* v35, 513-519. CSIRO Publishing

Kirkpatrick, Jay, F., *personal communication*, July 2008

Turner, John W. Jr, 2008, Controlled-release components of PZP contraceptive vaccine extend duration of infertility, *in Wildlife Research* v35, 555-562. CSIRO Publishing

Butch Roelle (USGS), Jason Ransom ( USGS), Allan Sheppard (US Bureau of Land Management), meeting at USGS Fort Collins Colo Science Centre, June 2008,

Websites **ZooMontana Science and Conservation Centre:**  
[http://www.zoomontana.org/conservation\\_center/index.html](http://www.zoomontana.org/conservation_center/index.html)

Wildlife Fertility Control - <http://www.pzpinfo.org/pzp.html>

USGS Fort Collins Science Centre -  
<http://www.fort.usgs.gov/WildHorsePopulations/Resources.asp>

SpayVac for Wildlife Org – [www.terramar.bc.ca/](http://www.terramar.bc.ca/)

Gray et al (2010) report that the reduced efficacy they observed in their study on PZP and GnRH treatments in wild horses when compared to previous studies was most likely due to the fact that some mares were already pregnant when they were treated in the first study year. These mares went on to foal normally and with no reported side-effects.

For example, Schulman et al (2013) looked at mares of different ages treated with Improvac and concluded that the use of this product in a large group of mares of various ages resulted in effective, reliably reversible suppression of ovarian activity within a two-year period.

Miller et al (2008) reviewed GonaCon use over a seven year period and reported minimal injection site reaction signs apart from a palpable lump not visually seen at the injection site.

Elhay et al (2007) looked at mares treated with Equity or with the adjuvant alone and found no significant local injection site reactions.