

Veterinary clinic

Working mums

Embryo transfer is gaining popularity and allows competition mares to keep performing while producing foals. But what does the process involve?

BREEDING from your mare is never a decision that should be taken lightly and requires much forethought and planning. And the option of embryo transfer (ET) poses an additional dimension — sourcing recipient mares and ensuring ovulations are entirely synchronised. First-time ET breeder Naomi Maxted-Massey decided to take the plunge with her mare, Delphy Tango (Orange), and kept a diary for *H&H*.

February

NAOMI has a first meeting with the team at Newmarket Equine Hospital (NEH) and breeder Alec Swan, who runs a local stud where the recipient mares will be based once they are (hopefully) in foal. Alec will be funding the AI process in return for a free embryo.

"If all goes to plan we will end up with two foals out of Orange by two different sires. For this reason, we agree that we ideally need four mares — two for each AI attempt to maximise a successful compatibility," says Naomi.

March

TWO recipient mares are found — Twiglet, a 16.1hh eight-year-old part-warmblood, who has bred one foal before, and Canterbury Park, a 16.3hh nine-year-old thoroughbred mare with a foal at foot.

Alec and Naomi decide on the stallion they want to use — No Limit from Whorridge Stud in Devon, and Curtis, who stands at the Oakham Veterinary Centre.

April

EQUINE vet Jan Pynn MRCVS from NEH visits Orange and the recipient mares to check their cycling patterns and begins planning the first transfer. Great news — Jan confirms with an ultrasound scan that Orange is in season.

Orange competes in the intermediate class at Belton Horse Trials, finishing 12th.

During the third week in April, Jan injects Orange with the hormone prostaglandin (PG), which brings a mare into season when it is known she is in mid-to



About Delphy Tango

NAOMI MAXTED-MASSEY'S 11-year-old mare Delphy Tango (Orange) is an intermediate eventer by Ohio, out of a mare by Grannex. She is also working at prix st georges level in dressage.

Naomi says: "Orange is a very sound horse, who is technically good over a fence and has a very trainable temperament. I've always wanted to breed a foal from her, but didn't want her to have time off work."

late-cycle. Two days later both Twiglet and Canterbury Park have the same injection.

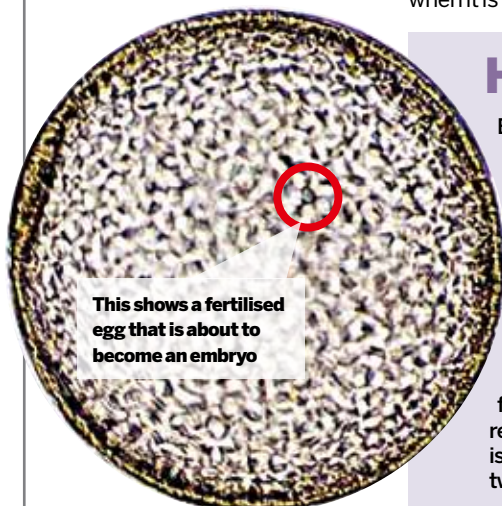
On 27 April, scans reveal that both Orange and Twiglet are in perfect sync for a first attempt. Jan orders semen from No Limit.

Jan inseminates Orange the following morning and injects her with the hormone Ovuplant,

which induces ovulation.

Jan says: "Chilled and frozen semen have a shorter lifespan than fresh, so it's important that the mare ovulates as close to insemination as possible."

Two days later, Jan checks that Orange has ovulated — she has. It is also noted that she has a small amount of fluid in her uterus, a



This shows a fertilised egg that is about to become an embryo

How embryo transfer works

EMBRYO transfer (ET) allows competition mares to keep performing while passing on their genes to the next generation. One of the major advantages is being able to breed more than once from a mare in one breeding season. It is quite usual for two different stallions to be selected and the ET process carried out twice, enabling one mare to produce two foals by two different stallions.

ET involves the transfer of an embryo from a mare who has been covered to a recipient. It is important that the recipient mare is at a similar stage in her cycle (ideally one to two days behind the donor mare) to ensure

that the embryo is being placed into a receptive environment.

Research has shown that the optimum time to perform the transfer is when the embryo is eight days old.

It is removed from the donor mare by flushing a sterile solution into the uterus; this fluid is then siphoned back out of the uterus and passed through a fine filter, which catches the embryo.

The embryo is then inserted through the cervix into the uterus of the recipient mare.

The international average for embryo recovery is 50%. There is an overall success rate of 40% per embryo flush.



Winning points at Intermediate level and having a first foal by ET has capped off a successful year for Naomi and Orange



fairly common post-insemination reaction. Jan treats this by flushing her out with a sterile saline solution and putting antibiotics into her uterus. Orange is also given oxytocin, a hormone to encourage her uterus to dispel the fluid.

Jan also injects Twiglet with Ovuplant to ensure that she ovulates at the correct time.

May

JAN checks Orange again on 1 May; her uterus looks clean. Twiglet is also scanned to check that she has ovulated — she has and this means she is nicely in sync with Orange and will be the recipient mare of choice for the embryo transfer.

8 May: all three mares take a trip to the NEH for the transfer. The flush is performed, but there is deflating news — no embryo is found. So it's back to the drawing board. Orange is treated with a PG injection to bring her back into season and the following day both

Twiglet and Canterbury Park have the same job.

The scanning process starts again three days later. Jan finds that Twiglet and Canterbury are both two days behind Orange in their cycle, which she is happy with (the recipient mares can be one day ahead and up to three days behind the donor mare in



Close synchronisation of the cycle of the surrogate and natural mother is essential to help an embryo thrive

their oestrus cycle), so semen is reordered from No Limit.

It's business as usual for Orange, who competes at Aston-le-Walls horse trials. She is then rushed back home for Jan to inseminate her in the evening.

Orange ovulates on time and her uterus is not affected by fluid. Twiglet ovulates within 48 hours of Orange, so again she is the recipient of choice.

Orange and Twiglet travel to NEH for a second try at ET. This time it is success and an embryo is found. Everyone gets a chance to see it under the microscope — it looks like a very small pearl.

The last week in May sees Orange complete the CCI** at Houghton Hall.

Jan has scanned Twiglet at 16 days and is delighted to see she has held on to the embryo.

"Due to the handling of the embryo there is a greater risk that the mare will not be in foal at 16 days than if she had been covered naturally," explains Jan. "When the embryo is retrieved, it is assessed under a microscope and it is possible to gauge from its appearance how successful the transfer will be. Embryos from older mares are not as robust as embryos from younger ones. The environment that the embryo is being transferred to will have a part to play in whether the embryo survives — that is why it's essential to pick the right recipient mare and to get her closely synchronised with the donor."

June

ON 11 June, Jan scans Twiglet and finds that the foetus has a very strong heartbeat. Success! The following day Orange has another PG jab to bring her into season.

We find a new, second recipient mare. Monty is an 11-year-old 16hh thoroughbred mare who has bred four foals before.

The embryo transfer process is repeated; Monty is the closest match for Orange. Once again, Canterbury Park is off the hook.

D-day arrives and Monty is scanned in foal, so we now have two foals due out of Orange.

Twiglet and Monty are

THE VERDICT?

NAOMI says: "The whole process went smoothly. I am fortunate to have good contacts, including the vets at Newmarket Equine Hospital, who handled the logistics for me, plus I had the benefit of a financial arrangement with Alec Swan, which meant the process was more viable from my point of view.

"I was pleased to be able to complete a full season of eventing almost entirely unhindered. I had to plan her campaign carefully and let the vets know her schedule as she needed sedating for the transfer itself, which meant that she wasn't able to compete until the drugs were out of her system. I also found that she became quite sore and one-sided, which I suspect was due to the intrusive nature of the ET. With the help of Julia Smith-Pearse, a McTimoney chiropractor, we managed to keep her as supple as possible.

"My advice to others would be to do your research, know how much it's going to cost and employ the best ET expertise you can."

now happily grazing at Alec Swan's stud while Orange continues to compete.

April 2011

TWIGLET gives birth to a healthy bay colt by No Limit (below).

We await the arrival of the second baby Orange next month with great anticipation. H&H

