



SHIRE HORSE SOCIETY – 2023



GUIDANCE NOTES ON THE USE OF SPARKS KINSHIP TABLES as at 10th April 2023

1. INTRODUCTION

The Shire Horse Society ('the Society') has adopted SPARKS from 2023 to tackle inbreeding in the Shire horse population. This is needed because inbreeding leads to loss of genetic diversity in the population, which, in turn, threatens the health of individual horses and the health and sustainability of the Shire breed as a whole, because it has the following consequences:

- increased infertility
- increased foal mortality (deaths)
- increased likelihood of harmful genes accumulating in the breed
- increases risk of inherited diseases and deformities
- reduced overall fitness of the breed and resistance to diseases

A powerful way of tackling inbreeding is by managing 'Mean Kinship' through selection of mare/stallion pairings.

2. WHAT IS SPARKS?

SPARKS is an advisory scheme that helps manage Mean Kinship and inbreeding. It is a computer programme that calculates Mean Kinships for every living pure-bred Shire in the Studbook, measuring how related any one Shire is to all others. SPARKS also calculates the potential inbreeding of foals resulting from specific mare/stallion pairings. Based on this analysis, SPARKS produces Kinship Tables for mares.

3. WHAT ARE KINSHIP TABLES?

The Kinship Tables are a tool to help breeders manage Mean Kinship and inbreeding via their decisions on which stallions to put to which mares. There is a Kinship Table for every living Shire mare in the UK who:

- is pure-bred and registered in the breeding section of the Studbook, and
- was born in or after 2003, up to and including 2021

Each Kinship Table is specific to an individual mare who is named on each page (three pages per mare) together with her date of birth, Studbook number and Mean Kinship coefficient. Based on the Mean Kinship coefficient, the mare is assigned to a Mean Kinship Band. Mares in Band A are of lowest Mean Kinship, i.e. are least related to the rest of the population, and those in Band H are the most related.

The mare information also gives the mare's Inbreeding Coefficient. This is a measure of how related an individual animal is to itself through common ancestors that appear on both sides of its pedigree, whether in recent or distant generations.

Each Kinship Table includes a list of pure-bred Shire stallions, with information on their colour, kinship figures, whether available for AI and location. **In the versions of the Tables published on the Society website in April 2023, these are stallions in the UK that had a Service Book in 2022 (except those no longer available, for example, gelded or exported), and colts and stallions that passed inspection in 2023. Mare owners must**

check whether the colt / stallion they select for mating with their mare in 2023 has a Service Book for 2023 before mating. This is a mare owner responsibility. If the colt/stallion does not have a Service Book for 2023, the Society will not be able to register the progeny in the breeding section of the Stud Book. Please also note that, because the list of stallions is based on past information, their availability and locations are not guaranteed.

The Table also gives the 'Co-ancestry Coefficient of Progeny' for each stallion/mare pairing. **This is the level of inbreeding that the resulting foal would have.** The lower this coefficient, the less inbred the foal would be. Co-ancestry coefficients of below 0.05 are considered acceptable whereas those of 0.05 and above are not.

4. HOW ARE KINSHIP TABLES USED?

The Kinship Tables are published on the Society's website and can be downloaded free of charge.

[SPARKS – The Shire Horse Society \(shire-horse.org.uk\)](http://shire-horse.org.uk)

Use of the Tables is voluntary and intended to help mare owners to select a stallion. The Tables do not relate to the physical attributes of any mares, stallions or potential foals, and breeders should continue to use their own best judgement in this regard. The Tables are an additional tool to add genetic health to dam/sire pairing decisions.

To facilitate help with interpretation of the Kinship Tables, the potential matings between mares and stallions are ranked into four Tiers in every Table. Tier 1 represents the best genetic pairings, and Tier 4 the worst. These are colour coded as follows:

TIER 1: The mare and stallion are from the same or an adjacent Kinship Band **AND** the mating would produce a foal of lower co-ancestry coefficient than the Mean Kinship of the Mare. These matings are said to be **'SPARKS compliant'** and are coloured green in the Kinship Tables. **THESE MATINGS ARE ENCOURAGED.**

TIER 2: The mare and stallion are from the same or an adjacent Kinship Band **BUT** the mating would result in a foal of higher co-ancestry coefficient than the Mean Kinship of the mare but still less than 0.05. These matings represent 'The Best of the Rest' and are coloured yellow in the Kinship Tables. **THESE MATINGS ARE THE PREFERRED ALTERNATIVE IF A SPARKS COMPLIANT OR 'GREEN' MATING DOES NOT EXIST OR IS NOT DESIRABLE.**

TIER 3: The mare and stallion are from widely differing Kinship Bands and Kinship Coefficients less than 0.05. These matings bring together genes in a way that puts less common genes at greater risk of loss. They are coloured orange in the Kinship Tables and **ARE DISCOURAGED.**

TIER 4: These matings, coloured red in the Kinship Tables, are highly inbred and increase the probability of deleterious genes/harmful traits being expressed in future generations as well as accelerating the loss of genetic diversity. **THESE MATINGS SHOULD BE AVOIDED.**

Please note:

- The tiering is an assessment of the merit of pairing of two horses. It is not an endorsement or criticism of the genetic makeup or physical characteristics of either horse.
- The **traffic light colours** are shown on the names of the stallions, but do not represent the level of inbreeding of the stallions themselves. They **represent the level of inbreeding that the foal would have** if the stallion was mated with the named mare.
- For **red matings**, the red traffic light colour is highlighted on the Co-Ancestry Coefficient of Progeny figure as well as on the stallion's name. This is to help distinguish between orange and red matings, given that the two colours may look similar on some computer screens.

5. IMPORTANT NOTES ON USING THE KINSHIP TABLES

Kinship Tables are valid for one year only because the Shire horse population, and therefore the kinship relationships within it, change each year. The Tables are therefore updated every year. The year for which the Tables are valid is shown at the top of each one. Please use the correct Tables for the year concerned, e.g. the 2023 Tables for matings to take place in 2023.

The 2023 Kinship Tables include mares born in or after 2003. Tables for mares born before 2003 are available on request from the Society office, quoting the mare's name and Studbook number. Please note that it may take over a week for the table to be produced and sent to you.

For information on which stallions that are listed in the Kinship Tables, see section 3 above.

Contact details for stallion owners are given in the 'Alphabetical list of UK stallions issued with a service book in 2022' document (go to this page on the Society's website and scroll down to find the link for the document <https://www.shire-horse.org.uk/forms/>), or contact the Society office info@shire-horse.org.uk

The Kinship Tables may include deceased stallions for which frozen semen is available. This information is provided to help with a broad range of breeding choices.

6. HOW TO FIND A MARE IN THE KINSHIP TABLES

The Kinship Tables are produced as 'pdf' electronic documents, in 12 alphabetical groups by prefix. The pdfs for each group can be downloaded from the Society's website. To find the Kinship Table for any mare:

- a. Go to the SPARKS page on the Society website [SPARKS – The Shire Horse Society \(shire-horse.org.uk\)](https://www.shire-horse.org.uk)
- b. Select the download link for the alphabetical group that includes the first letter of the mare's prefix
- c. Download the pdf from the link
- d. You can now search the pdf for the mare. You can do this by scrolling through the pdf, but it may be easier to search as follows:

Hold down the Ctrl key press the F key. You will see a search box has opened at the top of the page. Release both keys. Type the mare's stud book number, or her prefix and name, into the search box. The pdf should jump to the Kinship Table for that mare. Because stud book numbers are unique to individual horses, this may be the most efficient way to search. The pdf may jump to part-way through the Kinship Table you are interested in. You will need to scroll up to get to the top of the Table.

If you need phone help on downloading and using the Tables and finding mares in them, please contact one of the Society's volunteer SPARKS helpers. Their names and phone numbers are at the end of this document.

7. FINANCIAL SUPPORT

The Society provides SPARKS Foal Grants to encourage Tier 1 'green' and Tier 2 'yellow' matings. These Grants are payable to mare owners who are members of the Society on successful registration with the Society of a pure-bred Shire foal from a Tier 1 or Tier 2 mating, whether by natural service or AI. The Grants for foals from 2023 matings will be payable in 2024. The values will be:

Tier 1 matings ('green' matings), at least £200 **Tier 2 matings** ('yellow' matings), at least £100

Each year, there will be a specific fund for payment of the grants. The amounts shown are guaranteed. Any residual funds will be shared between the qualifying mare owners.

There are no payments for Tiers 3 and 4 ('orange' and 'red' matings respectively).

8. CORRECTIONS AND ANOMALIES

The information in the Kinship Tables is only as good as the information in the Society's Studbook, so the more up to date the Studbook, the better. Therefore, if you see a mare in the Kinship Tables that you know has died or been exported, please notify the Society office, sending in the passport if you have it. Likewise, if you see information that is not or might not be correct about any horse, please let the office know.

9. CONTACT DETAILS AND HELP

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SPARKS volunteer helpers

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Note for researchers. The data provided in the Kinship Tables are highly filtered from the SPARKS database and should not be taken as an accurate representation of the current Shire horse population. As such they are not suitable for research purposes.

