

## BREEDING FOR RACING PERFORMANCE IN HORSES

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### SUMMARY

This study reports the success of a particular sire line in producing winners of the South Australian Sire Produce Stakes. Winning performances of the SA Sires Produce Stakes (1973-1998) were dominated by the Nearco sire line and its Nasrullah, Royal Charger and Nearctic branches. The predicted reduction in winning time of 1.93 seconds was significant ( $P=0.047$ ) over the 26 year period that this event has been raced over 1,600 metres. The effect of environmental effects especially track conditions on racing performances was also discussed.

**Keywords:** Horse racing, sires, thoroughbreds, track

### INTRODUCTION

Cunningham (1991) reported that winning times are not decreasing much, if at all in the long distance British horse races such as the Derby and Oaks (2,414 metres) and the St Leger (2,816 metres). In studies of Australian horse racing performance, (Gallagher *et al.* 1992) showed no significant decrease in time for winners of the 2,040 metre Cox Plate for the period 1947-1992. Recently, Gallagher *et al.* (1997) reported a highly significant reduction in winning time for the Golden Slipper 1,200 metre races conducted in the period 1957-1996. The lack of consistent improvement in racing speed warrants enquiry since the heritability of Timeform handicap weight ratings is high (Gaffney and Cunningham 1988; Cunningham 1991). This study aimed to quantify winning 1,600 metre racing performances of two year old colts, geldings and fillies in the South Australian Sires Produce Stakes and to identify the most successful sire lines in this event as well as environmental factors influencing performance.

### MATERIALS AND METHODS

A study was conducted on the data of the South Australian Sires Produce Stakes (Anon.1973-1998). Multiple regression analysis (SAS 1989-1996) was used to establish rate of change of winning time in the Sires Produce Stakes since the introduction of the event at the metric distance of 1,600 metres in 1974. The dependent variable T= time recorded in seconds for each winning horse (Tsps, Sires Produce Stakes) while the independent variables included were year (1973-1998) and track condition (scored as follows: fast=1, good=2, dead=3, slow to heavy=4).

The ancestry of winning horses was determined from the report of Anon.(1998a).

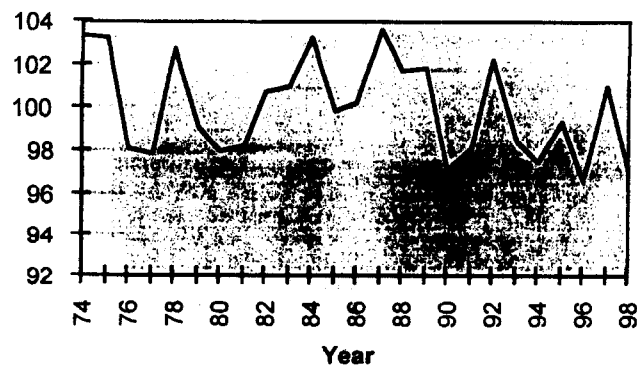
## RESULTS AND DISCUSSION

A highly significant regression equation was found for the Sires Produce Stakes as shown in Table 1. The predicted reduction in winning time of 1.93 seconds over the twenty six year period was significant ( $P=0.047$ ). It was noted the important independent variable was track condition with extremely slow times recorded (Fig 1) on a heavy track in 1987 by Cindy's Appeal (103.6 sec) and on slow tracks Zasu in 1974 (103.4 sec.), Rondelay in 1975 (103.2 sec), Count Babylon in 1978 (102 sec) and Kingston Spirit in 1992 (102.28sec). The record for this event (96.6 sec) was established by Litmus on a good track in 1996.

**Table 1. Regression relationships between winning time in seconds in South Australian Sire Produce Stakes, (Sps) dependent variable and independent variables year (Y), track conditions (T)**

Dependent variable	Constant	Independent variables	$r^2$
Sps (1973-1998)	244**	-0.074Y* +1.50T***	0.68***

\*\*\* $P<0.001$  \*\* $P<0.01$  \*  $P<0.05$



**Figure 1. Timed winning performances in the SA Sires Produce Stakes (1973-1998).**

The current study also emphasises the success of particular sire lines in producing winners of the Sire Produce Stakes. Winning performances were dominated by the Nearco sire line and especially the Nasrullah, Royal Charger and Nearctic branches (Table 2). An important sire line in the 1990's was Polynesian whose descendants Kingston Spirit, Zoffoff and Umrum were winning performers in 1992, 1994 and 1997 respectively.

**Table 2 Nearco and Polynesian Sire lines back to 1930 of winners of the S.A. Sire Produce Stakes (1973-1998)**

Year/Winner						
1973 Bush Win	⇐Natural Bid	⇐Nasrullah	⇐Nearco			
1979 Tell Fibs	⇐Showdown	⇐Infatuation	⇐Nearco			
1980 Who Can Say	⇐Soverign Edition	⇐Sovereign Path	⇐Grey Sovereign	⇐Nasrullah	⇐Nearco	
1982 Aree lad	⇐Arch Sculptor	⇐Habitat	⇐Sir Gaylord	⇐Turn To	⇐Royal Charger	⇐Nearco
1983 Taminor	⇐Estaminet	⇐Sovereign Path	⇐Grey Sovereign	⇐Nasrullah	⇐Nearco	
1984 Unique Dancer	⇐Lord of the Dance	⇐Nijinsky II	⇐Northern Dancer	⇐Nearctic	⇐Nearco	
1985Tristabelle	⇐Sir Tristram	⇐Sir Ivor	⇐Sir Gaylord	⇐Turn To	⇐Royal Charger	⇐Nearco
1986 El Vaquero	⇐Adraan	⇐Zeddaan	⇐Grey Sovereign	⇐Nasrullah	⇐Nearco	
1987 Cindy's Appeal	⇐Cindy's Son	⇐Sir Gaylord	⇐Turn To	⇐Royal Charger	⇐Nearco	
1988 Almutajaz	⇐Danzatore	⇐Northern Dancer	⇐Nearctic	⇐Nearco		
1990 Abandoned War	⇐McGinty	⇐One Pound Sterling	⇐Sovereign Path	⇐Grey Sovereign	⇐Nasrullah	⇐Nearco
1992 Kingston Spirit	⇐Raise A Cup	⇐Raise A Native	⇐Native Dancer	⇐Polynesian		
1993 Trivia Lass	⇐Western Symphony	⇐Nijinsky II	⇐Northern Dancer	⇐Nearctic	⇐Nearco	
1994 Zoffoff	⇐Zoffany	⇐Our Native	⇐Exclusive Native	⇐Raise A Native	⇐Native Dancer	⇐Polynesian
1995 Niarchos	⇐Space Cadet	⇐Danzatore	⇐Northern Dancer	⇐Nearctic	⇐Nearco	
1997 Umrum	⇐Umatilla	⇐Miswaki	⇐Mr Prospector	⇐Raise A Native	⇐Native Dancer	⇐Polynesian

The improved winning time noted in this South Australian study since 1973 over the shorter distance of 1,600 metres contrasts with the plateau of racing times reported for the longer distance English Classic races (Cunningham 1991). Racing performance based on Timeform handicap weights (rather than winning times) have been found to be highly heritable (Langlois 1980, Gaffney and Cunningham 1988). Despite these findings the predicted genetic improvement in Timeform ratings for the English thoroughbred population as a whole is 1% per annum (Gaffney and Cunningham 1988). However the low correlation between handicap weight and corrected time (Bormann 1966) led Langlois (1980) to conclude that speed and handicap are not measuring the same ability. Furthermore winning times being isolated performances of individuals seem likely to be further

removed from handicap ratings. Beatson (1989) suggested that improvement in winning times is restricted by the low variability of time performances between animals within the classic English race events the Deby, Oaks and St Leger.

Presinger *et al* (1990) suggested that heritability estimates are over estimated by the exclusion of complex environmental effects eg. the trainer. The importance of trainer effects was also reported by Schulze-Schleppinghoff *et al* (1987) and other authors highlight additional factors that need to be taken into account when explaining variation in racing performance. These include herd and dam effects (Tavernier 1988), racing surfaces ie. dirt or turf (Oki *et al.* 1994) , Gallagher *et al.* (1997) and also in the current study, jockey effects (Oki *et al.* 1995) and pre-race horse behaviour (Hutson and Haskell 1996).

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