

SURVIVAL OF *EUCALYPTUS SALIGNA* GRAFTED BY DIFFERENT METHODS

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ABSTRACT

Scions from selected trees of *Eucalyptus saligna* differed in survival following grafting. The best grafting method was the side graft and the worst was budding. Both the cleft and splice methods of grafting provided some degree of success.

INTRODUCTION

Because of its adaptability to a range of sites, the genus *Eucalyptus* is important for exotic forestry in Brazil. Grafted seed orchards have been favoured as a means of supplying the necessary seed requirements. They have many economic and practical advantages over seedling stands but at present they also show a high incidence of incompatibility. This paper reports a study carried out jointly by the Nuclear Energy Center for Agriculture (CENA) and Escuela Superior de Agricultura Luiz de Queiroz, University of São Paulo (ESALQ-USP) Department of Forestry to obtain more information on the problem of grafting in *Eucalyptus* with particular reference to incompatibility.

MATERIALS AND METHODS

Eucalyptus saligna Smith was the species investigated. All grafting was carried out in the ESALQ-USP Department of Forestry nursery. The rootstocks were transplanted from a nursery bed first to polystyrene blocks and then to polythene bags one litre each in volume. At the time of grafting the rootstocks were 5 months old and 70-75 cm tall. The scion material came from 5 ortets in the FEPASA Forest Reserve in Rio Claro—São Paulo State. The trees were planted in 1919 from an Australian seed source, and at the time of scion collection were 50-60 m in height and 60 cm in diameter.

The experimental design was a randomised block consisting of four treatments (= types of grafting) \times five replicates, each replicate being a different clone, and containing 20 grafts. The four treatments were:

- (1) cleft grafting
- (2) splice grafting
- (3) side grafting
- (4) budding

Descriptions of the grafting procedures for each treatment have been given by Pryor and Willing (1963). Scions were collected on 9 October 1972 and stored in a

cold room until grafts were made during the following two days. The grafts were tied with tape and, except for the budding treatment, were covered with a polythene bag. The bags and the tape were removed after a month. Survival counts were made (i) 43 days after grafting and (ii) 135 days after grafting.

RESULTS

The percentages of the graft which survived and which were dried out at the two assessment dates are given in Table 1.

The values were transformed into their arc-sin percentages and examined by analysis of variance. Treatment and clonal effects for survival were statistically significant at each assessment time, and calculations of least significant difference were made by Tukey's test.

Budding was clearly not successful, but the other three treatments all produced surviving grafts. Side grafting was the most successful method, and survival with that treatment was significantly better than with the other treatments at the 1% level after 43 days and at the 5% level after 135 days; it requires however more skill from the grafter. Clonal differences in survival were significant at the 1% level at both times. With all clones survival was less as time went on, presumably as a result of environmental factors with effects on the anatomy and physiology of grafts.

TABLE 1—Percentage survival and drying-out

Type of graft	Clone 1		Clone 2		Clone 3		Clone 4		Clone 5		Mean	
	SUR*	DO*	SUR	DO	SUR	DO	SUR	DO	SUR	DO	SUR	DO
(a) 43 days after grafting												
cleft	90	10	5	95	55	45	30	70	80	20	52	48
side	100	0	50	50	70	30	80	20	100	0	80	20
splice	90	10	10	90	40	60	65	35	90	10	59	41
budding	0	100	0	100	0	100	0	100	0	100	0	100
(b) 135 days after grafting												
cleft	70	30	0	100	10	90	25	75	55	45	32	68
side	90	10	20	80	30	70	50	50	55	45	49	51
splice	70	30	0	100	10	90	45	55	60	40	37	63
budding	0	100	0	100	0	100	0	100	0	100	0	100

* SUR = Survived

* DO = Dried-out

CONCLUSIONS

Clearly both the nature of the clone and the type of grafting method are important if *Eucalyptus saligna* is to be satisfactorily used clonally in seed orchards. The further emphasis in research should be on trying to improve the splice grafting technique to obtain a higher survival rate with a wide range of clonal material. The problem of incompatibility at a later stage needs further investigation.

REFERENCE

PRYOR, L. D. and WILLING, R. R. 1963: The vegetative propagation of *Eucalyptus*—an account of progress. *Aust. For.* 27, 52-62.