EVOLUTION OF P. RADIATA SOIL SURVEY IN W.A.

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Soil survey for P. radiata growing is highly specialised. Hence there is ample justification for breaking away from the standard method of soil classification, based on colour and texture of profiles, and using local names for the types identified.

This breaking away has been going on piecemeal over many years.

The earliest soil surveys of P. radiata plantations were carried out by J. O'Donnell in 1935*, using the standard method. However correlation of types with P. radiata site quality was not generally consistent.

Four associations and 12 types with several phases in each were identified. This method was used until about 1941 when the work ceased. After the World War, in the 1950's the work was carried out again by Van Noort, using O'Donnell's four associations for broad scale reconnaissance surveys.

Detailed surveys, using systematic grid followed, with variations being mapped as phases. After 1956 the "Alluvial" association was dropped, and "Metamorphic" included with the other three - (Basic, Granitic and Lateritic.)

These association names are still used, and refer to the nature of the parent materials from which the solum is derived.

In 1960 a convention was introduced on soil plans to indicate 3 grades of suitability for P. radiata in addition to existing information. The grades were suitable, doubtful and unsuitable.

The inclusion of the "Plantable Limit" or "Soil Boundary" came in a year or so later.

This information on the soils is all that the man in the field requires.

The system worked very well in the northern divisions where differences are quite clear-cut. However it has been a headache in the Karri forest belt, where nearly all laterites are in an advanced state of truncation and there is bewildering variation in the parent rock types, to say nothing of anomalous chemical analysis figures and recent-lateritisation effects.

This would have made the soil plans for the Southern region very complicated, so another method was developed.

This divided the association up into phases based on suitability and is currently in use. It eliminates unnecessary phase boundaries which had little bearing on suitability. Thus deep sands and pale shallow clayey soil can be lumped together in a single phase unit i.e. granitic - unsuitable. Lower case letters after the association capital letter denotes these phases. e.g. the above is "G(c)" while a suitable phase is "G(a)".

The table below should indicate the use of this convention - and further details can be obtained from my dissertation 'Soil Surveying for Pinus Radiata in Western Australia' available from the Forests Dept., Library.

However this writer feels the need to subdivide the classes into more groups for the use of planners, hence the use of half-phases e.g. "G(a-b)", and the use of 6 suitability groups, and a total of 14 phases to be used.

Productivity Class	Genetic Class (type or association).	Present Phase Symbol.	Probable SQ	Broad Suitability Range. (Present system).	Symbol used on soil plans.	Proposed future nomenclature of phases
Excellent	Basic Granitic	B(a) G(a)	1 - 11			A
Good	Basic Granitic	B(a) G(a)	111	Suitable	None	B
Satisfactory	Basic Granitic	B(b) G(a-b)	1V			C
Doubtful	Basic Granitic	B(c) G(b)	V and poorer	Doubtful	o	D
Submarginal (May be worth experimenting with fertilizer treatments etc. in future).	Basic Granitic Lateritic	B(c) G(b-c) L(a)	Probable Fail.			E
Useless	Basic Granitic Lateritic	B(c) G(c) L(b),L(c)	Certain Failure	Unsuitable	ø	F

It can be seen from the table that the present phase symbol scheme is unsatisfactory - e.g. "B(c)" occurs in 3 different groupings.

Obviously a simpler system would be to adopt the 6-phase system shown in the right column of the table - it uses Capital letters and corresponds to the 6 suitability ratings.

The old associations need not be dropped, as they are still quite useful checks on the soil surveyor's work.

This system, using 5 classes (A - E) was found to be quite workable in a 25,000 acre reconnaissance of coastal sands in the Pemberton Division.

* See "Soils of the Mundaring Weir Plantations"; by J.O'Donnell. 1935.
$ "Solum":- A and B horizon excluding the overburden of organic matter, litter etc.

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