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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

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STANDARD PROBABILITY LEVELS FOR COY

Document prepared by the Office of the Union

1. At its twenty-second session, held in Tsukuba, Japan, from June 14 to 17, 2004, the Technical Working Party on Automation and Computer Programs (TWC) discussed "Standard Probability Levels for COY" on the basis of document TWC/22/10. It was agreed that the accuracy of the information provided in that document would be rechecked and a new document would be prepared, including the diagrams of the four cases representing the different situations which may arise where COYD and COYU are used in DUS testing.

2. Annex I presents the information on probability levels used in COY for China, Czech Republic, Denmark, Finland, France, Germany, Kenya, Netherlands, United Kingdom and the United States of America on the basis of replies to Circular U 3441 of May 18, 2004. Annex II presents the diagrams of the four cases representing the different situations which may arise where COYD and COYU are used in DUS testing.

3. The TWC is invited to consider how the information presented in the annexes to this document might be used in the development of TGP/9 "Examining Distinctness" and TGP/10 "Examining Uniformity".

[Two annexes follow]

ANNEX I

STANDARD PROBABILITY LEVELS USED FOR COYD AND COYU

Case A Test is conducted over 2 independent growing cycles ("cycles") and decisions made after 2 cycles (A growing cycle could be a year and is further on denoted by cycle)

			COYD probability levels			**COYU probability levels**		
Species	**Country**	**CASE**	p_{d2}	p_{nd2}	p_{d3}	p_{u2}	p_{nu2}	p_{u3}
Brassica napus L. oleifera	UK	A	0.02			COYU not used		

Case B Test is conducted over 3 cycles and decisions made after 3 cycles

			COYD probability levels			**COYU probability levels**		
Species	Country	**CASE**	p_{d2}	p_{nd2}	p_{d3}	p_{u2}	p_{nu2}	p_{u3}
Zea mays L.	KE	B			0.05			0.05

Case C Test is conducted over 3 cycles and decisions made after 3 cycles, but a variety may be accepted after 2 cycles

			COYD probability levels			COYU probability levels		
Species	**Country**	**CASE**	p_{d2}	p_{nd2}	p_{d3}	p_{u2}	p_{nu2}	p_{u3}
Herbage	CZ	C	0.01		0.01	0.01		0.001
	FR	C	0.01		0.01	0.01		0.001
	UK	C	0.01		0.01	0.01		0.001
	NL	C	0.01		0.01	not used?		not used?
Grasses.	FI	C	0.01		0.01	0.01		0.001
Clovers.	FI	C	0.01		0.01	0.01		0.001
Lolium perenne L. Lolium multiflorum L. Lolium Boucheanum L. Festuca rubra L. Beta vulgaris L. Sinapsis alba L.	DK	C	0.01		0.01	0.002		0.002
Brassica napus l.	DK	C	0.01		0.01	0.002		0.002
Brassica napus L. oleifera	CZ	C	0.05		0.05	not used		not used
	FI	C	0.01		0.01	0.01		0.001
Brassica rapa L. var rapa L.	FI	C	0.01		0.01	0.01		0.001
Brassica rapa L. var silvestris (and other cross-pollinated vegetable crops).	UK	C	0.05		0.05	Under discussion		Under discussion
Festuca pratensis Huds.	DK	C	0.01		0.01	0.002		0.002
Linum usitatissimum L.	NL	C	0.05		0.05	not used?		not used?
Pisum sativum L.	UK	C	0.02		0.02	0.001		0.001

Case D Test is conducted over 3 cycles and decisions made after 3 cycles, but a variety may be accepted or rejected after 2 cycles

			COYD probability levels			**COYU probability levels**		
Species	**Country**	**CASE**	p_{d2}	p_{nd2}	p_{d3}	p_{u2}	p_{nu2}	p_{u3}
Vicia faba L. var. minor Raphanus sativus L. var. oleiformis Pers.	DE	D	0.01	0.05	0.01	0.02	0.002	0.002
Brassica napus L. oleifera	DE	D	0.01	0.05	0.01	0.02	0.002	0.002
Trifolium pratense L.	DE	D	0.01	0.05	0.01	0.02	0.002	0.002
Secale cereale L. Mustard Phleum pratense L. Phleum bertolonii Festuca rubra L. Festuca pratensis Huds. Festuca ovina L. sensu lato Ryegrass	DE	D	0.01	0.05	0.01	0.02	0.002	0.002

[Annex II follows]

ANNEX II

STANDARD PROBABILITY LEVELS USED FOR COYD AND COYU

The following four cases are those which, in general, represent the different situations which may arise where COYD and COYU are used in DUS testing:

Case A. Test is conducted over 2 independent growing cycles and decisions made after 2 growing cycles (A growing cycle could be a year and is further on denoted by cycle)

Case B. Test is conducted over 3 independent growing cycles and decisions made after 3 cycles

Case C. Test is conducted over 3 independent growing cycles and decisions made after 3 cycles, but a variety may be accepted after 2 cycles

Case D. Test is conducted over 3 independent growing cycles and decisions made after 3 cycles, but a variety may be accepted or rejected after 2 cycles

The stages at which the decisions are made in Cases A to D are illustrated in figures 1 to 4 respectively. These also illustrate the various standard probability levels (p_{d2}, p_{nd2}, p_{d3}, p_{u2}, p_{nu2} and p_{u3}) which are needed to calculate the COYD and COYU criteria depending on the case. These are defined as follows:

Probability Level	**Used to decide whether a variety is :-**
p_{d2}	distinct after 2 cycles
p_{nd2}	non-distinct in a characteristic after 2 cycles
p_{d3}	distinct after 3 cycles
p_{u2}	uniform in a characteristic after 2 cycles
p_{nu2}	non-uniform after 2 cycles
p_{u3}	uniform in a characteristic after 3 cycles

In figures 1 to 4 the COYD criterion calculated using say the probability level p_{d2} is denoted by $LSDp_{d2}$ etc., and the COYU criterion calculated using say the probability level p_{u2} is denoted by UCp_{u2} etc. The term "diff" represents the difference between the means of a candidate variety and another variety for a characteristic, while "U" represents the mean adjusted log(SD+1) of a variety for a characteristic.

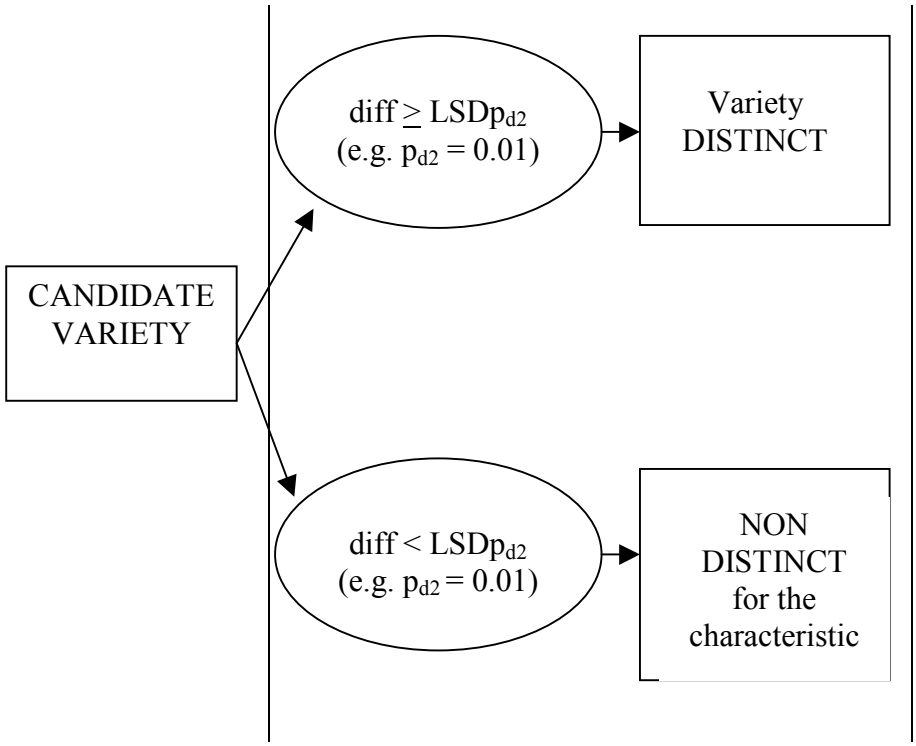
Table 1 summarises the various standard probability levels needed to calculate the COYD and COYU criteria in each of Cases A to D. For example, in Case B only two probability levels are needed (p_{d3} and p_{u3}), whereas Case C requires four (p_{d2}, p_{d3}, p_{u2} and p_{u3}).

Table 1	COYD			COYU		
CASE	p_{d2}	p_{nd2}	p_{d3}	p_{u2}	p_{nu2}	p_{u3}
A		■	■		■	■
B	■	■		■	■	
C		■			■	
D						

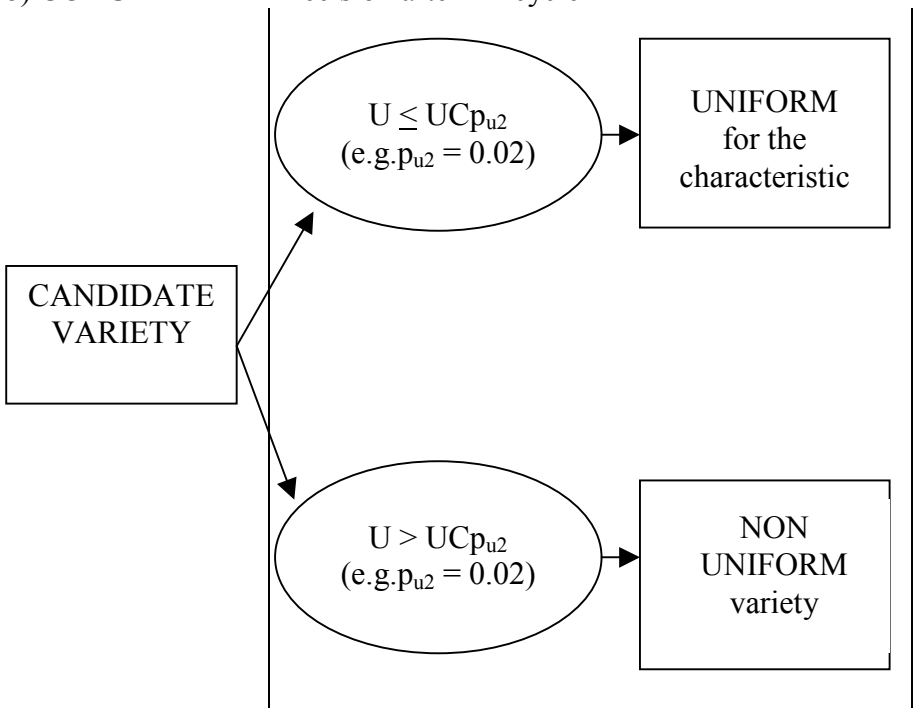
Please complete the Table in Annex II to list each of the species tested using COYD and COYU by your authority. For each species please indicate the type of test (Case A, B, C or D), and, depending on the type of test, the standard probability levels you use. The example of Herbage in United Kingdom is given. This is tested as per Case C.

Figure 1. COYD and COYU decisions and standard probability levels (p_i) in Case A

a) COYD Decision after 2nd cycle

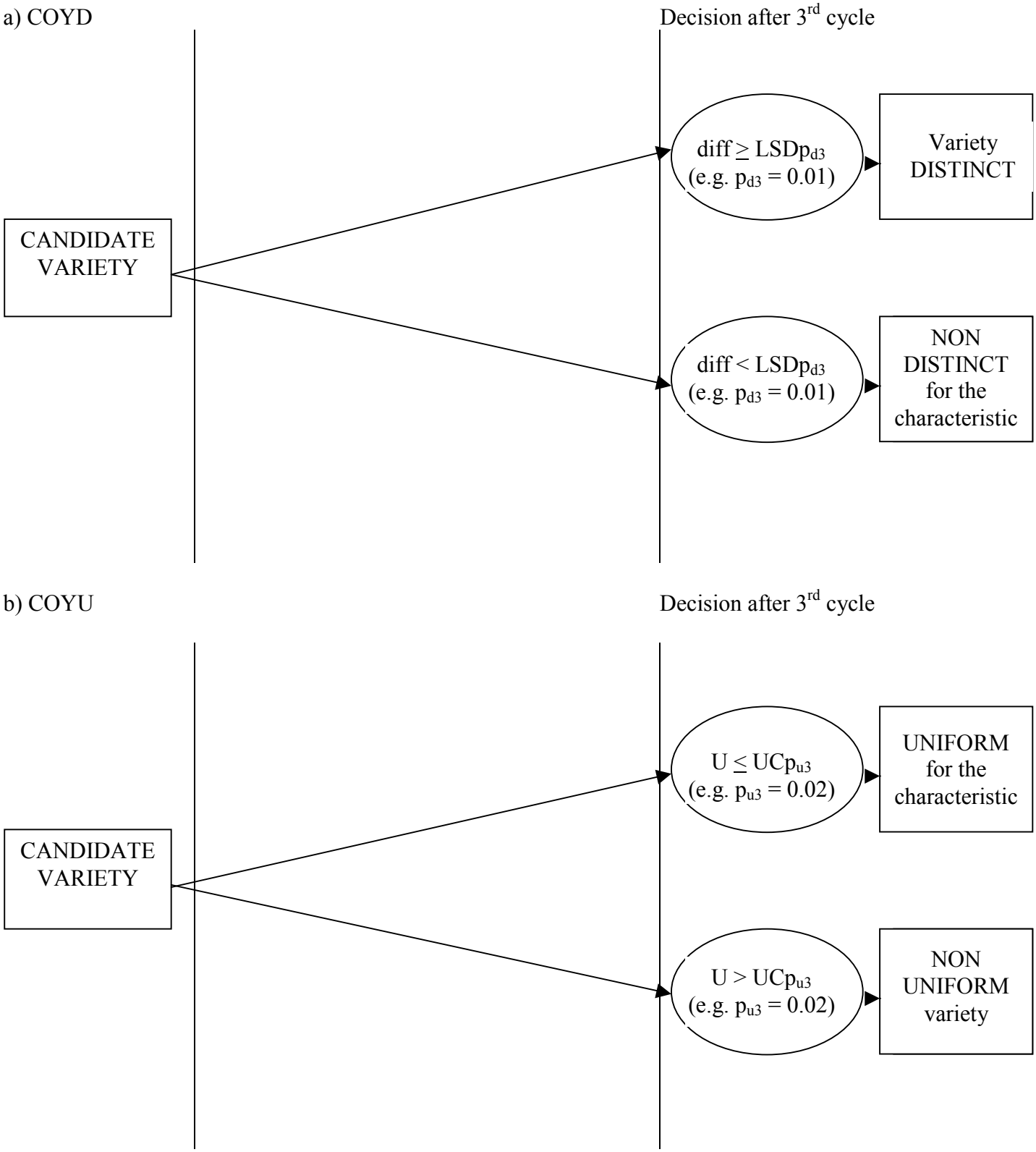


b) COYU Decision after 2nd cycle



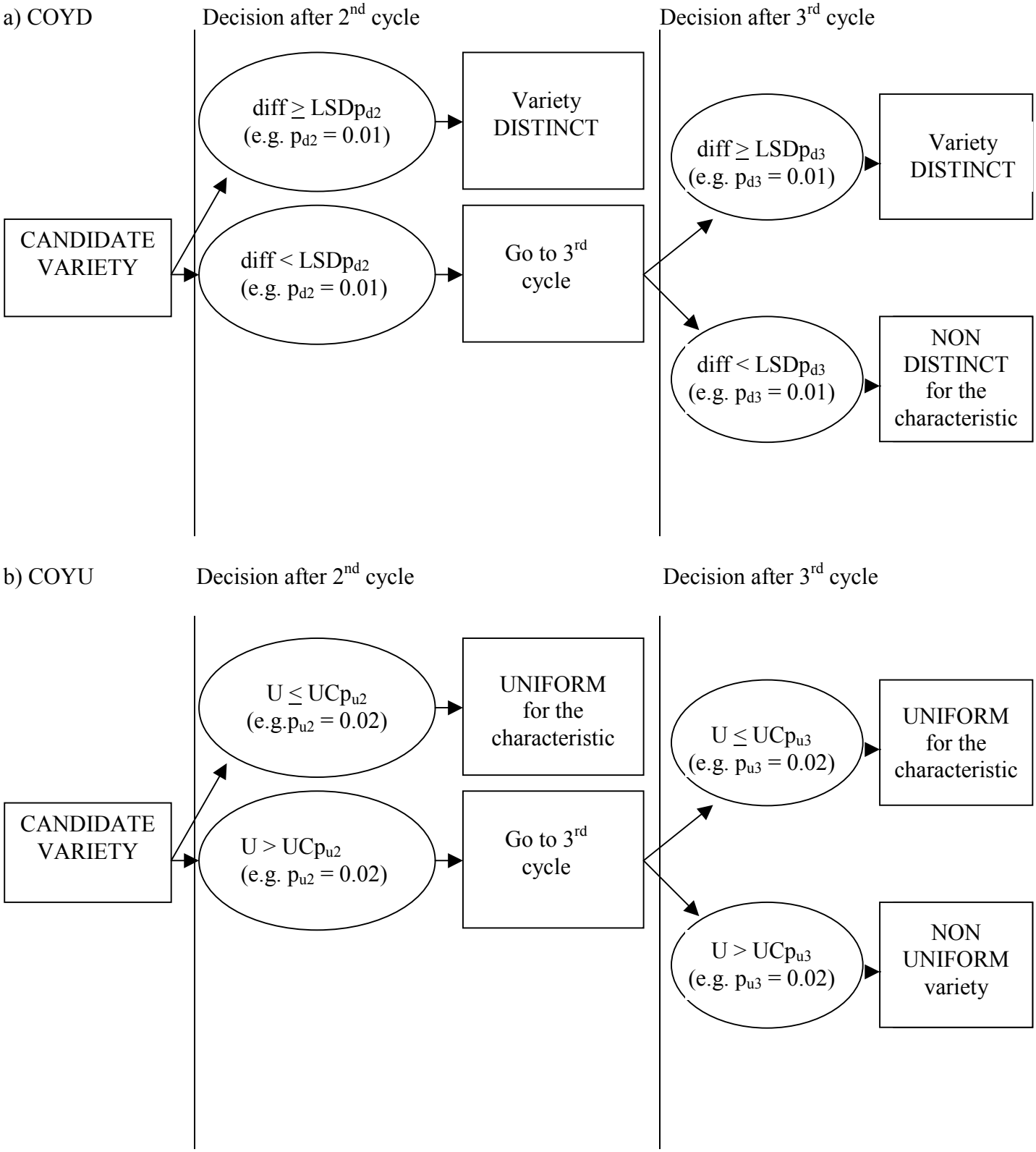
NOTE:-
"diff" is the difference between the means of the candidate variety and another variety for the characteristic
LSDp is the COYD criterion calculated at probability level p.
"U" is the mean adjusted log(SD+1) of the candidate variety for the characteristic.
UCp is the COYU criterion calculated at probability level p.

Figure 2. COYD and COYU decisions and standard probability levels (p_i) in Case B



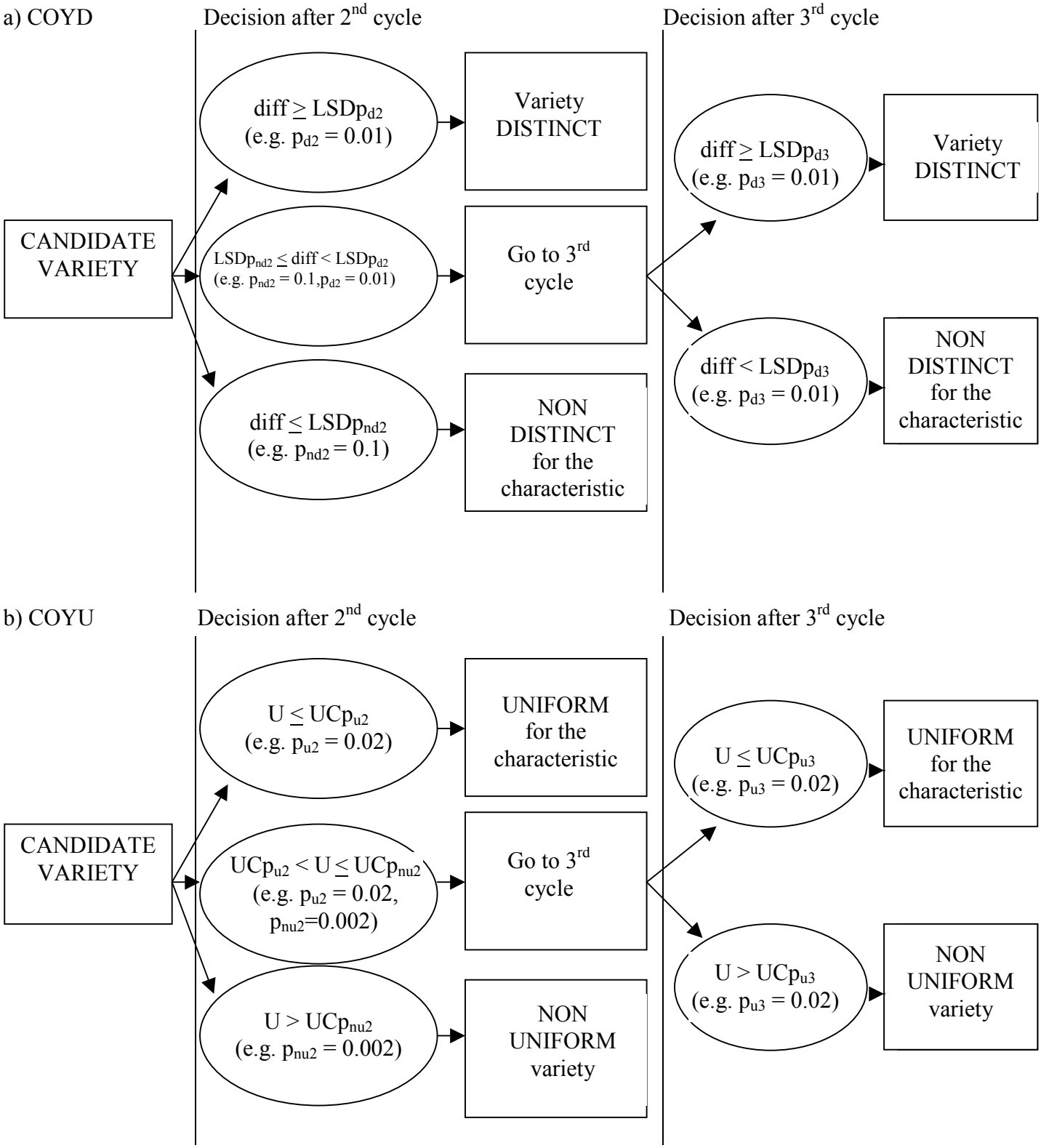
NOTE:-
"diff" is the difference between the means of the candidate variety and another variety for the characteristic
LSDp is the COYD criterion calculated at probability level p.
"U" is the mean adjusted log(SD+1) of the candidate variety for the characteristic.
UCp is the COYU criterion calculated at probability level p.

Figure 3. COYD and COYU decisions and standard probability levels (p_i) in Case C



NOTE:-
"diff" is the difference between the means of the candidate variety and another variety for the characteristic
LSDp is the COYD criterion calculated at probability level p.
"U" is the mean adjusted log(SD+1) of the candidate variety for the characteristic.
UCp is the COYU criterion calculated at probability level p.

Figure 4. COYD and COYU decisions and standard probability levels (p_i) in Case D



NOTE:-
"diff" is the difference between the means of the candidate variety and another variety for the characteristic
LSDp is the COYD criterion calculated at probability level p.
"U" is the mean adjusted log(SD+1) of the candidate variety for the characteristic.
UCp is the COYU criterion calculated at probability level p.

[End of Annex II and of document]