LIST OF ABBREVIATIONS

%  percentage
μM  micro Mole
ºC  Degree Centigrade
2,4-D  2,4-dichlorophenoxycetic acid
2ip  2-isopentyl adenine
2n  diploid condition of nucleus
ABA  Abscisic acid
ADH  Alcohol Dehydrogenate
APs  Apetal like Proteins
B5  Gamborg’s Media
BAP  6-Benzylaminopurine
cm  Centimeter
Conc.  Concentrated
cv.  cultivar
d  Days
DM  Dry Weight
DMRT  Duncans Multiple Range Test
EDTA  Ethylenediaminetetraacetic acid
EREBPs  Ethylene Response Element binding Proteins

I
ERFs

Ethylene Response Factors

et al.

and others

etc.

etcetera

FAQO

Food and Agriculture Organization

FW

Fresh Weight

g

grams

GA3

Giberallic acid

h

hours

ha

Hectare (unit of an area)

IAA

Indole-3-acetic acid

Kg/ha

Kilogram per hectare

KIN

Kinetin

MC

Moisture Content

Mg/l

Milligram per liter

mgl⁻¹

milligram per liter

min

minute

ml

milli liter

MRT

Multiple Range Test

MS

Murashege and Skoog Media

MT

Metric Tons (Unit of weight)

N

Normal solution

N&N

Nitsch and Nitsch Media

NAA

α-Naphthalene acetic acid

II
NAD Nicotinamide adenine dinucleotide
nm nano meter
NSC Non Structural Carbohydrate
NSC Non-sugar content
O. sativa Oryza sativa
PDC Pyruvate decarboxylase
PEG Polyethylene glycol
ppm parts per million
psi pounds per square inch
Qt. Quintal (unit of weight)
sp. Species
TDZ Thidiazuron
UV Ultra Violet
var. variety
W Watt
w/v weight by volume
w/w weight by weight
ZEA Zeatin
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table No.</th>
<th>Description of Tables</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Media Formulations used for tissue culture</td>
<td>50</td>
</tr>
<tr>
<td>3.2</td>
<td>Stock Solution of Plan Growth Regulators</td>
<td>51</td>
</tr>
<tr>
<td>3.3</td>
<td>Hormonal Combinations and concentrations used for seed germination and callus induction in Swarna Sub1 and their code</td>
<td>54-55</td>
</tr>
<tr>
<td>3.4</td>
<td>Media for regeneration of Callus</td>
<td>57</td>
</tr>
<tr>
<td>3.5</td>
<td>Composition of Hoagland’s solution</td>
<td>59</td>
</tr>
<tr>
<td>3.6</td>
<td>Different soil media for regenerants of SwarnaSub1</td>
<td>59</td>
</tr>
<tr>
<td>3.7</td>
<td>Weather data during crop period (Kharif 2010-2011)</td>
<td>60</td>
</tr>
<tr>
<td>4.1</td>
<td>Standardization of Sterilization Techniques</td>
<td>66</td>
</tr>
<tr>
<td>4.2</td>
<td>Selection of Media for callus induction and growth in Swarna Sub1</td>
<td>68</td>
</tr>
<tr>
<td>4.3</td>
<td>Effect of different plant hormones on rice callus induction and phenotypic characters</td>
<td>75-77</td>
</tr>
<tr>
<td>4.4</td>
<td>Mean for regeneration performance of selected callus</td>
<td>86</td>
</tr>
<tr>
<td>4.5</td>
<td>DMRT analysis for different in vitro studies of SwarnaSub1 characterized on media RM12</td>
<td>88</td>
</tr>
<tr>
<td>4.6</td>
<td>Effect of different soil media on the survival percentage of Swarna Sub1</td>
<td>92</td>
</tr>
<tr>
<td>4.7</td>
<td>Comparative yield analysis of in vivo and in vitro raised plantlets of Swarna Sub1</td>
<td>94</td>
</tr>
<tr>
<td>4.8</td>
<td>Submergence test for in vitro and in vivo raised plantlets of Swarna Sub1</td>
<td>97</td>
</tr>
<tr>
<td>4.9</td>
<td>Biochemical study on total soluble sugar (TSS) content (mg/g fresh wt.) under submergence set</td>
<td>99</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Plate No.</th>
<th>Description of plates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1</td>
<td>Calli raised in B5 media containing 2,4-D (2 mg/l)</td>
</tr>
<tr>
<td>1:2</td>
<td>Calli raised in N&amp;N media containing 2,4-D (2 mg/l)</td>
</tr>
<tr>
<td>1:3 –1:5</td>
<td>Calli raised in MS media containing 2,4-D (2 mg/l)</td>
</tr>
<tr>
<td>1:6</td>
<td><em>In vitro</em> seed germination of Swarna <em>Sub1</em> in MS media supplemented with 2,4-D (2.5mg/l) and KIN (1.5mg/l)</td>
</tr>
<tr>
<td>1:7</td>
<td><em>In vitro</em> seed germination of Swarna <em>Sub1</em> in basal MS media</td>
</tr>
<tr>
<td>2:1</td>
<td><em>In vitro</em> callus induction of rice seeds in MS media supplemented with 2,4-D (1.5 mg/l)</td>
</tr>
<tr>
<td>2:2</td>
<td><em>In vitro</em> callus induction of rice seeds in MS media supplemented with 2,4-D (1.5mg/l) and BAP (0.5mg/l)</td>
</tr>
<tr>
<td>2:3</td>
<td>Callus of rice depicting oily callus appearance</td>
</tr>
<tr>
<td>2:4</td>
<td>Callus of rice depicting light yellow callus colour</td>
</tr>
<tr>
<td>2:5</td>
<td>Callus of rice depicting compact callus type</td>
</tr>
<tr>
<td>2:6</td>
<td>Embryogenic calli developed in MS media supplemented with 2,4-D (1.5mg/l) and NAA (1.0mg/l)</td>
</tr>
<tr>
<td>3:1</td>
<td>Shoot initiation (organogenesis) in regeneration media (RM12)</td>
</tr>
<tr>
<td>3:2</td>
<td>Regenerated shoots after 30 days of inoculation in RM12 media</td>
</tr>
<tr>
<td>3:3</td>
<td>Fully developed shoots in regeneration media after 45 days of culture</td>
</tr>
<tr>
<td>4:1</td>
<td>Root initiation in regeneration media (RM12)</td>
</tr>
<tr>
<td>4:2</td>
<td>Fully hardened plantlets of rice ready to be transferred to the field</td>
</tr>
</tbody>
</table>