Source and Sink Relationship

Surma Mitra, S.N. Bhardwaj and G.C. Srivastava
Division of Plant Physiology,
Indian Agricultural Research Institute,
New Delhi 110 012, India

CONTENTS

Abstract 363
I. Introduction 363
II. Assimilate Transport 363
a) Loading and unloading in phloem 364
b) Apoplastic versus symplastic transport 364
III. Factors Regulating Source and Sink 367
a) Environmental 367
(i) Light 367
(ii) Temperature 367
(iii) Water 368
(iv) CO₂ 368
b) Nutritional 369
(i) Potassium 369
(ii) Phosphorus 369
b) Metabolic 370
(i) Role of Pi 370
(ii) Role of F 2, 6 BP and fructose bisphosphatase 371
(iii) Regulation via SPS 371
d) Hormonal 372
(i) Photosynthesis 373
(ii) Mobilization of assimilates 374
IV. Source and Sink Interaction 375
a) Regulation 376
(i) Wheat 376
(ii) Pea 378
(iii) Sunflower 378
(iv) Mung bean 378
b) Manipulation 378
V. Conclusions 381
VI. References 382

ABBREVIATIONS

Cycocel : 2 Chloroethyl trimethyl ammonium chloride
F6P : Fructose-6-phosphate;
F 1,6 BP : Fructose 1, 6 bisphophate;
F 2,6 BP : Fructose 2, 6 bisphosphate;
F6P, 2K : Fructose 6 phosphate, 2 kinase;
G6P : Glucose 6 phosphate;
Pi : Inorganic phosphate;

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RuBP</td>
<td>Ribulose bisphosphate;</td>
</tr>
<tr>
<td>RuBPcase</td>
<td>Ribulose bisphosphate carboxylase;</td>
</tr>
<tr>
<td>SPP</td>
<td>Sucrose phosphate phosphatase;</td>
</tr>
<tr>
<td>SPS</td>
<td>Sucrose phosphate synthase;</td>
</tr>
<tr>
<td>TP</td>
<td>Triose phosphate;</td>
</tr>
<tr>
<td>UDP</td>
<td>Uridine diphosphate</td>
</tr>
<tr>
<td>CER</td>
<td>CO₂ exchange rate</td>
</tr>
</tbody>
</table>