



!

Dept. of Bioresource Engineering

Dépt. de génie des bioressources

!

! "#\$%&'(!)*+!*,* -!

!

!"#\$%&'()*+!, - .! , /0(1/2!'! 3 4 5 ())!6/7!8 ')!9:9;!

!

. %/(!0#11%/23%4+!

!

56%! 78 .! 9#4::#6! :4! /\$/:1/'1%! <#(! =/11! * , *>! /;! ?@A:11! B6:\$%(4;C! :6!

! D . %9/(&%6;! #<! E:#(%4#3(@%! F62:6%%(:62G!! I8%! (%4%/(@8! ;#9:@! :4! #6! ;8%! /(%/! #<! "+4/26(<=7'*)+!

3 +4- '2(4')! 3 +1' > '1+7(')0!! I8%#(%;:@/1!/6J!@#&93;/;:#6/1!&31;:4@/1%!&#J%11:62!/1#62!K;:8!L . !9(:6;:62!/6J!%M9%(:&%6;/! @8/(/@;%(N/;:#6!K:11! '%13;:1:N%J!<#(!&31;:98C4:@4!&31;:4@/1%J%4:26!/6/1C4:4+!/6J!</ '(;@/;:#6!#<(/;:#6/11C!J%4:26%J!/(@8;:%@;J! &31;:<36@;:#6/1!&/;%(:/14!! I8%!@/6J:J/;%!K:11!K#(0!36J%(!;8%!439%(\$:4:#6!#<!7(#<!!P /&:J!QO' /N/J%8!/? !?@A:11!B6:\$%(4;C!!

!

R%S3:(%J!S3/1:<:@/;:#64!<#(!;8%!9#4::#6!/(%T!

!

D)G!U;(#62!' /@02(#36J!:6! " #61:6%/(!'3@01:62!/6/1C4:4+!QJ\$/6@%J!&%@8/6:@4!#<!&/;%(:/14!0#&93;/;:#6/1!&31;:4@/1%6#61:6%/(! &%@8/6:@4!Q(@8;:%@;J!&%;/&/;%(:/14+!/6J! ? 31;:98C4:@4!4:&31;/;:#6!/6J!@8/(/@;%(N/;:#6!!

!

D*G! 7:(#! %M9%(:%6@%! #6! R#@#6<:23(/'1%! &%;/&/;%(:/14+! U8/9%! @8/62:62! &/;%(:/14+! ? /@8:6%! 1%/(6:62+!/6J!L . !9(:6;:62! #<!

!