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HPSOR\HG DV UHMXYHQDWLRQ WKHUDSLHV DUH DQWLFLSDW  
DQG ROGHU 7KH UHODWLYHO\ VKRUW QDWXUDO OLIHVSDQ R  
H[SHGLWLQJ WKH GHYHORSHPHQW RI WKHUDSLHV IRUWKXIPDDV  
ZKLFK PLFH FDQ EH JHQHWLFDQ\ DOWHUHG DOORZV IRU WK  
VWXG\ RI WKH HIIHFWLYHQHV RI EORRG VWHP FHOO HQJUDI  
RI ERQH PDUURZ WUDQVSODQWV

7\SLFDOO\ ZKDW ZLOO EH GRQH WR DQ DQLPDO XVHG LQ \RX

,Q VNLQ VWXGLHV DQLPDOV W\SLFDOO\ XQGHUJR D VXUJLFD  
VNLQ SXQFK QRW H[FHHGLQJ PP LQ GLDPHWHU :H ZLOO HY  
UHFYHU\ SURFHVV 8SRQ FRPSOHWLRQ RI WKH SURWRFRO  
FROOHFWHG

)RU EORRG VWXGLHV DQLPDOV ZLOO EH H[SRVHG WR LUUDG  
E\ LQMHWLRQ ZLWK GRQRU EORRG FHOOV FRPPRQO\ DGPLG  
EORRG VDPSONV ZLOO EH FROOHFWHG IURP WKH DQLPDOV W  
UHMXYHQDWLRQ \$W WKH HQG RI WKH SURWRFRO PLFH ZLOC

,Q VWXGLHV H[DPLQLQJ VDIHW\ ZLWK UHVSHFW WR FDQFHU  
WKH VNLQ RU LQWUDYHQRXVO\ WDLO YHLQ ZLWK FDQFHU F  
UHMXYHQDWLRQ PHWKRGV LPSDFW WKH WXPXU EXUGHQ DQ  
7KHUHIRUH WKH DQLPDOV ZLOO EH KXPDAQHO\ NLOOHG ZKLO

7KHVH H[SHULPHQWV ZLOO KHOS GHWHUPLQH WKH VDIHW\ DC  
KHOS KXPDAQ SDWLHQWV

:KDW DUH WKH H[SHFWHG LPSDFWV DQG RU DGYHUVH HIIHFW

,Q PRVW LQVWDQFHV DQLPDOV DUH QRW H[SHFWHG WR H[KL  
DQLPDOV PD\ KDYH DQ DOWHUHG LPPXQH V\VWHP UH\$QHBDQ  
ZLWK PRGLLHG LPPXQH VWDWXV ZLOO EH KRXXHG LQ D EDUI  
RI FRPSURPLVLQJ WKHLU KHDOWK

)XUWKHUPRUH DJHG PLFH RIWHQ GLVSOD\$GGLWLRQDDQGDQF  
RFFDVLRQDOO\ H[SHULHQFH SDUWLDO RU FRPSOHWH EOLQGC  
IUHTXHQWO\ WKH GHYHORSHPHQW RI FDWDUDFWV RU FRUQHD  
EHKDYLRXU UHVXOWLQJ LQ PLQRU VXSHUILFLDO ZRXQGV :K  
PLFH V EHKDYLRXU LI LW LV FDXVHG E\ D FORXG\ H\H LW FI  
VFHQDULR XOFHUDWLRQ RI WKH H\H

\$QLPDOV WKDW KDYH XQGHUJRQH LUUDGLDWLRQ RU WUHDWF  
VXVFHSHWLEOH WR ZHLJKW ORVV 7KHUHIRUH WKHVH DQLPDC

6RPH DQLPDOV UHFHLYLQJ VXEFXWDQHRXV XQGHU WKH VNLQ  
GXH WR WKH WXPXU PDVV ZKLFK FRXOG LPSHGH QRUPDO P

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\$QLPDOV XVHG LQ ZRXQG KHDOLQJ VWXGLHV W\SLFDO-ORZHH[SH  
WKH\ PD\ GLVSOD\ VLJQV RI VZHOOHQJ ZKLFK W\SQWLOG\ZRH  
SURFHVV QDWXUDOO\ FRQFOXGHV ZLWKLQ GD\V SRVW VXU

([SHFWHG VHYHULW\ FDWHJRULHV DQG WKH SURSRUWLF  
:KDW DUH WKH H[SHFWHG VHYHULWLHV DQG WKH SURSRUWLF  
W\SH "

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0RGHO	6HYHULW\	3HUFHQWDJH
0LFH	0LOG	
0LFH	0RGHUDWH	
0LFH	6HYHUH	

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:KDW ZLOO KDSSHQ WR DQLPDOV XVHG LQ WKLV SURMHFW"  
• .LOOHG  
• .HSW DOLYH DW D OLFHQVHG HVWDEOLVKPHQW IRU QRQ L

## 5HSODFH PHQW

6WDWH ZKDW QRQ DQLPDO DOWHUQDWLYHV DUH DYDLODEOH  
FRQVLGHUHG DQG Pđ€pH

0RQDQX QRQD`PDD`K ESSHQ \OO IWHGw`D ° @ @000P DKP SXW LQ



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7KH HQWLUH SURJUDP V DQLPDO XVDJH ZLOO EH VWUHDPOLC  
EUHHGLQJ DQG H[SHULPHQWV HQVXULQJ WKDW WKH PLQLPX  
DGGUHVU UHVHDFK TXHULHV DQG FRQGXFW XQELDVHG VWX

ORUHRYHU LQ SUHYLRXV VWXGLHV ZH KDYH DGKHUHG WR W  
GHVLJQ WRRO KWWSV ZZZ QF UV RUJ XN H[SHULPHQWDOGH  
DGYLFH SURMHFW OLFHQFH DSSOLFDQWV UHGXFWRQ :H KI  
JXLGLQJ RXU DQLPDO H[SHULPHQW SODQQLQJ WR DFKLHYH P  
FRXQW 7KHVH WRROV DORQJ ZLWK LQVLJKWV JDLQHG IURP

G G DO HZKUPQIUR SUH H[SU ` p P€p0p°ðð0€0P€pÀ€` F QWHC

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XVH DUH QRW DQWFLSDWHG WR H[KLELW DGYHUVH HIIHFWV  
PLQLPDOO\ LQYDVLYH ZLWK DQ HPSKDVLV RQ DYRLGLQJ ORC

,Q RXU ZRXQG KHDOLQJ H[SHULPHQWV ZH HPSOR\ SXUSRVH  
TXLFNO\ FUHDWLQJ XS WR WZR ZRXQGV SHU PRXVH 7KXVH I  
KHDOLQJ DQG PLQLPLVLQJ DQLPDO GLVFRPIRUW :H UHVWULI  
LQ GLDPHWHU DQG WKH SURFHGXUH LV H[FOXVLYHO\ SHUIRU  
SDLQ IRU WKH DQLPDOV \$GGLWLRQDOO\ DVHSWLF EDQGDJL  
ZKLOH DOORZLQJ WKH DQLPDOV WR PRYH IUHHO\

)RU H[SHULPHQWV UHTXLULQJ WKH LUUDGLDWLRQ RI PLFH W  
FRPSRVLWLRQ ZH DGRSW D VWUDWHJ\ WR PLWLJDWH VXIIHU  
LQMHFWLQJ KHOSHU FHOOV

,Q WKH LQYHVWLJDWLRQ RI LPPXQH FHOO DQG WXPXU LQW  
GHYHORSPHQW RI VNLQ WXPXUV &ORVH PRQLWRULQJ LV LF  
WKXVH DQLPDOV DQG KXPQH HXWKDQDVLD LV HPSOR\HG LI



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GRVH ZLOO EH DGPLQLVWHUHG LQ D VSOLW GRVH WR PLWLJ  
FRQGLWLRQLQJ UHJLPHQ

,Q DJHLQJ VWXGLHV HQGSRLQWV VXFV DV EHKDYLRXU ERG\  
ZLOO EH XVHG WR DVVHVV PDUNHUV RI DJHLQJ 7KLV DSSURI  
SURORQJHG SDLQ XQWLO GHDWK IURP ROG DJH 7KXVH PDUN  
ZHOO EHLQJ RI PLFH DQG KXPQFH FXOOLQJ ZLOO EH HULLPSIOHIF  
QHFHVVDU\

:KDW SXEOLVKHG EHVW SUDFWLFH JXLGDQFH ZLOO \RX IROO  
WKH PRVW UHILQHG ZD\"

:H ZLOO DGKHUH WR JXLGHOLQHV SHUWDLQLQJ WR UHFRUG N  
H[SHULPHQWDO UHVXOWV \$GGLWLRQDOO\ ZH FRPPLW WR IR  
([SHULPHQWV \$55,9( JXLGHOLQHV ZKLFK HQFRPSDVV DVSHI  
ELDV SUHYHQWLRQ DQG VWDWLWVLFDO DQDO\VLV RI UHVXO

)RU DOO SURFHGXUHV DQG DQLPDO FDUH ZH ZLOO VWULFWC  
SURYLGHG E\ WKH 1DWLRQDO &HQWUH IRU WKH \$OLSPDOFH RI Q  
1& 5V KWWSV ZZZ QF UV RUJ XN ZHOIDUH DVVHVVPHQW [  
KWWSV ZZZ MD[ RUJ QHZV DQG LQVLJKWV MD[EORJ PDU  
IRU UHSURGXFLEOH PRXVH UHVHDFK

,Q WKH FRQWH[W RI FDQFHU VWXGLHV ZH ZIRUO RUDHQHUVWVROW  
\*XLGHOLQHV IRU WKH ZHOIDUH DQG XVH RI DQLPDOV LQ FDC  
GRL VM EMF

)RU PDQDJHPHQW RI DJHG PLFH ZH ZLOO UHIHU WR JXLGHOL  
WKH FDUH KXVEDQGU\ DQG PDQDJHPHQW RI DJHLQJ PLFH XV  
GRL

%\ FRQVLVWHQWO\ IROORZLQJ DQG FRQVXOWLQJ WKHVH JXL  
WUDQVSDUHQW HIILFLHQW XVHIXO DQG UHSURGXFLEOH UH  
DQLPDO VXIIHULQJ DQG HQVXULQJ WKDW DQ\ VXFV VXIIHULQ  
IRU VLJQLILFDQW FRQWULEXWLRQV WR PHGLFLQH DQG VFLHC

+RZ ZLOO \RX VWD\ LQIRUPHG DERXW DGYDQFHV LQ WKH 5V  
HIIHFWLYHO\ GXULQJ WKH SURMHFW"

:H ZLOO FRQVLVWHQWO\ FKHFN WKH 1& 5V ZHEVLWH WR VWD  
UHJDUGLQJ WKH UHILQHPHQW RI RXU SURFHQWUH \$GGLWLRQDO  
WR WKH 563&\$ ZHEVLWH KWWSV VFLHQFH UVSAe€pòUJ XNHC