

Online resource 5. Farmers' explanation of why they reduced the cultivation of landraces by municipalities

<i>Changes in Multilevel Perspective</i>		<i>Farmers' explanations</i>		<i>Municipalities and elevation (m)</i>					
				<i>Puente de Ixtla</i>	<i>Amacuzac</i>	<i>Mazatepec</i>	<i>Tetecala</i>	<i>Miacatlán</i>	<i>Coatlán del Río</i>
				900	922	960	994	1023	1073
<i>Technological regime</i>	Affecting landraces	Farmers preferred hybrids for their:							
		Yield by grain weight	Focus groups Interviews	an, am, ar, cu, d, t	cu, d, i an	an, d, n, ro, t	an, ar, d, n, ro, t	an, d, t an	an, d, n, t an, t
		Lodging resistance	Focus groups Interviews		an				
		Resistance to grain pests and diseases	Focus groups Interviews		cu, d, i				an, d, n, t
		Ability to produce two cobs	Focus groups Interviews						
		Ability to tolerate high population densities	Focus groups Interviews						
<i>Scientific regime</i>	Affecting landraces	Landraces were incompatible with hybrids' cultivation system	Focus groups Interviews	an, am, ar, cu, d, t					
		Farmers observed that land fertility deteriorated, preferring hybrids	Focus groups Interviews			an		an	
<i>Market regime</i>	Affecting landraces	Farmers preferred hybrids within a market oriented system	Focus groups Interviews						
		Tortilla producers preferred hybrids (also <i>Technological regime</i>)	Focus groups Interviews			an, d, n, ro, t	an, ar, d, t		
		Farmers preferred buying tortillas to planting maize or making tortillas	Focus groups Interviews		an				
		Landraces could not compete with hybrids' higher yield and lower price	Focus groups Interviews						
		Landraces could not compete with maize from other states	Focus groups Interviews	an, am, ar, cu, d, t					
		Farmers preferred hybrid fresh corn-on-the-cob	Focus groups Interviews				an		
				an		an			
	Affecting preference for specific landraces	Farmers preferred the Ancho landrace	Focus groups Interviews						
		Black and red landraces were disliked in public mills	Focus groups Interviews			n, ro			
		Black and red landraces would cross with white maize when planted too close	Focus groups Interviews						
		Oxen yokes were abandoned, whose rent was paid with Delgado landrace	Focus groups Interviews	d					
	Affecting maize	Other crops gained popularity:							
		Tomato	Focus groups Interviews						
		Fruit crops	Focus groups Interviews						
		Nopal	Focus groups Interviews						
		Sorghum	Focus groups Interviews		an				
		Rice	Interviews			an			
		Sugar cane	Interviews						

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				900	922	960	994	1023	1073
Cultural regime	Affecting landraces	Farmers who adopt hybrids were perceived as innovative	Focus groups						
		Aging farmers abandoned the cultivation of distant plots	Interviews						an, d, n, t
	Affecting maize		Focus groups						
		Fewer descendants and field workers were interested in agriculture	Interviews	an, am, ar, cu, d, t					
		Farmer-donor retirement or death	Interviews					an	
Policy regime	Affecting landraces	Interviewee was working out of town	Interviews	an, ro					
		Subsidies for hybrids coupled with agricultural extension	Focus groups						
	Affecting maize		Interviews	an, d	an			an	an, t
		<i>Ejido</i> certification program	Focus groups						
		Irrigation project in Tetela del Volcán	Interviews						
Macro level	Affecting landraces		Focus groups						
		Farmers observed that dry spells' frequency increased, preferring hybrids	Interviews	an, n, ro	d				
	Affecting maize	Population increase, urbanization, industrialization	Focus groups						
Other explanations			Interviews		an				
		Plots sold, rented or transferred due to owner's aging, sickness or to avoid family conflict	Interviews					d	
		Seed lot lost to pests during storage	Interviews						
		Introduced a different seed lot of the same landrace from relative or market	Interviews						
		Introduced a different landrace more resistant to pests and with better husk	Interviews						
		Introduced hybrids following the advice of landowners	Interviews					an	
		Farmer-donor introduced hybrids but interviewee cannot recall / does not know why	Interviews	an		t			

Some categories from the MLP such as the infrastructure regime and the niche level did not emerge among farmers' responses.

Columns show the frequency each explanation was mentioned during interviews and focus groups. Sums of column frequencies do not correspond with the number of interviews or focus groups. Interviewees and focus group participants often provided multiple explanations to abandon one seed lot/landrace. Alternatively, a single cause could explain a reduction in the cultivation of multiple seed lots/landraces.

Landraces: am, Amarillo; an, Ancho; ar, Arrocillo; cr, Criollo; cu, Cuarenteño; d, Delgado; dm, Del Monte; i, Itizihuine; n, Negro; r, Rojo; t, Tehuacán.

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Changes in Multilevel Perspective		Farmers' explanations	Municipalities and elevation (m)						
			Xochitepec	Yautepec	Temixco	Jiutepec	Cuernavaca	Yecapixtla	Zacualpan
			1112	1210	1313	1355	1510	1580	1640
Technological regime	Affecting landraces	Farmers preferred hybrids for their:							
		Yield by grain weight	Focus groups	an, ar, d, t					an, d, n, t
		Lodging resistance	Interviews	d					
		Resistance to grain pests and diseases	Focus groups	an, ar, d, t					an, d, n, t
		Ability to produce two cobs	Interviews		an, d, n, d				
		Ability to tolerate high population densities	Focus groups						
Scientific regime	Affecting landraces	Landraces were incompatible with hybrids' cultivation system	Focus groups	an, d, n					
		Farmers observed that land fertility deteriorated, preferring hybrids	Interviews						
				an					
Market regime	Affecting landraces	Farmers preferred hybrids within a market oriented system	Focus groups	an, cu, d, i, n, ro, t	an, ar, d, t	an, d, t			
		Tortilla producers preferred hybrids (also <i>Technological regime</i>)	Interviews						
		Farmers preferred buying tortillas to planting maize or making tortillas	Focus groups	an					
		Landraces could not compete with hybrids' higher yield and lower price	Interviews						
		Landraces could not compete with maize from other states	Focus groups	n					
		Farmers preferred hybrid fresh corn-on-the-cob	Interviews	an, n					
	Affecting preference for specific landraces	Farmers preferred the Ancho landrace	Focus groups						
		Black and red landraces were disliked in public mills	Interviews						
		Black and red landraces would cross with white maize when planted too close	Focus groups						
		Oxen yokes were abandoned, whose rent was paid with Delgado landrace	Interviews	ro					
	Affecting maize	Other crops gained popularity:	Focus groups						
		Tomato	Interviews						
		Fruit crops	Focus groups						
		Nopal	Interviews						
		Sorghum	Focus groups	an, d, n, ro, t					
		Rice	Interviews	an					
		Sugar cane	Interviews	d					

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			Xochitepec	Yautepec	Temixco	Jiutepec	Cuernavaca	Yecapixtla	Zacualpan	
			1112	1210	1313	1355	1510	1580	1640	
Cultural regime	Affecting landraces	Farmers who adopt hybrids were perceived as innovative	Focus groups	an, cu, d, i, n, ro, t						
		Interviews								
	Affecting maize	Aging farmers abandoned the cultivation of distant plots	Focus groups							
		Interviews								
		Fewer descendants and field workers were interested in agriculture	Focus groups	an, d, n						
Affecting maize and/or maize	Farmer-donor retirement or death	Interviews	t	an, n						
	Interviewee was working out of town	Interviews	d	an						
		Interviews	d							
Policy regime	Affecting landraces	Subsidies for hybrids coupled with agricultural extension	Focus groups	an, d, n, ro, t						
		Interviews	an, d	d	an, d, t					
	Affecting maize	Ejido certification program	Focus groups	an, n						
		Interviews								
		Irrigation project in Tetela del Volcán	Focus groups							
Macro level	Affecting landraces	Farmers observed that dry spells' frequency increased, preferring hybrids	Focus groups	an, d, n, ro, t						
		Interviews	an	an, d						
	Affecting maize	Population increase, urbanization, industrialization	Focus groups	n						
Other explanations			Interviews	an	an	an	an, n	an, d, n		
		Plots sold, rented or transferred due to owner's aging, sickness or to avoid family conflict	Interviews	an	an	an	an, n	an, d		
		Seed lot lost to pests during storage	Interviews	n	d	an, d, n				
		Introduced a different seed lot of the same landrace from relative or market	Interviews	an, n						
		Introduced a different landrace more resistant to pests and with better husk	Interviews	an						
		Introduced hybrids following the advice of landowners	Interviews	an						
		Farmer-donor introduced hybrids but interviewee cannot recall / does not know why	Interviews	cr	d					

Some categories from the MLP such as the infrastructure regime and the niche level did not emerge among farmers' responses.

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Landraces: am, Amarillo; an, Ancho; ar, Arrocillo; cr, Criollo; cu, Cuarenteño; d, Delgado; dm, Del Monte; i, Itizihuine; n, Negro; r, Rojo; t, Tehuac

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Changes in Multilevel Perspective		Farmers' explanations	Municipalities and elevation (m)								
			Tlayacapan	Atlatlahucan	Tepoztlán	Totolapan	Tlalnepantla	Tetela del Volcán			
			1640	1644	1700	1901	2060	2066			
Technological regime	Affecting landraces	Farmers preferred hybrids for their:									
		Yield by grain weight	Focus groups	d							
			Interviews								
		Lodging resistance	Focus groups	d	am, n						
			Interviews								
		Resistance to grain pests and diseases	Focus groups	d							
		Interviews									
		Ability to produce two cobs	Focus groups								
			Interviews								
		Ability to tolerate high population densities	Focus groups								
			Interviews	an							
		Scientific regime	Affecting landraces	Landraces were incompatible with hybrids' cultivation system	Focus groups	am, d, ro					
					Interviews						
Farmers observed that land fertility deteriorated, preferring hybrids	Focus groups			am, n							
		Interviews									
Market regime	Affecting landraces	Farmers preferred hybrids within a market oriented system	Focus groups	an, d							
			Interviews	an, d							
		Tortilla producers preferred hybrids (also <i>Technological regime</i>)	Focus groups	an, d, dm							
			Interviews	an, d							
		Farmers preferred buying tortillas to planting maize or making tortillas	Focus groups								
			Interviews	an							
		Landraces could not compete with hybrids' higher yield and lower price	Focus groups	t							
			Interviews	an	cr						
		Landraces could not compete with maize from other states	Focus groups								
			Interviews								
		Farmers preferred hybrid fresh corn-on-the-cob	Focus groups								
			Interviews								
	Affecting preference for specific landraces	Farmers preferred the Ancho landrace	Focus groups	t	d	am, d, n					
			Interviews			cr	d, dm	cr, cu, n			
		Black and red landraces were disliked in public mills	Focus groups								
			Interviews	n							
			Black and red landraces would cross with white maize when planted too close	Focus groups							
				Interviews							
			Oxen yokes were abandoned, whose rent was paid with Delgado landrace	Focus groups							
				Interviews							
			Affecting maize	Other crops gained popularity:							
				Tomato	Focus groups	n	d				
					Interviews	an					
				Fruit crops	Focus groups	cu, n					
	Interviews	cr, n									
Nopal	Focus groups	an, d, dm									
	Interviews	an, d, dm									
Sorghum	Focus groups										
		Interviews									
		Interviews									
		Interviews									

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			1640	1644	1700	1901	2060	2066	
Cultural regime	Affecting landraces	Farmers who adopt hybrids were perceived as innovative	Focus groups						
		Interviews	cr						
		Aging farmers abandoned the cultivation of distant plots	Focus groups	cr				dm	
		Interviews					dm		
	Affecting maize	Fewer descendants and field workers were interested in agriculture	Focus groups	cr					
	Affecting landraces and/or maize	Farmer-donor retirement or death	Interviews	an		an	an	an	cr, n
Interviewee was working out of town		Interviews	an						
Policy regime	Affecting landraces	Subsidies for hybrids coupled with agricultural extension	Focus groups						
	Affecting maize		Interviews						
		Ejido certification program	Focus groups	d					
			Interviews						
		Irrigation project in Tetela del Volcán	Focus groups	cu, n					
			Interviews						
Macro level	Affecting landraces	Farmers observed that dry spells' frequency increased, preferring hybrids	Focus groups						
			Interviews						
	Affecting maize	Population increase, urbanization, industrialization	Focus groups						
			Interviews						
Other explanations		Plots sold, rented or transferred due to owner's aging, sickness or to avoid family conflict	Interviews	an					
		Seed lot lost to pests during storage	Interviews						
		Introduced a different seed lot of the same landrace from relative or market	Interviews	an				an	
		Introduced a different landrace more resistant to pests and with better husk	Interviews						
		Introduced hybrids following the advice of landowners	Interviews						
		Farmer-donor introduced hybrids but interviewee cannot recall / does not know why	Interviews						

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Changes in Multilevel Perspective		Farmers' explanations	Summaries				
			Focus groups (19)		Interviews (66)		
				Freq.	Landraces	Freq.	Landraces
Technological regime	Affecting landraces	Farmers preferred hybrids for their: Yield by grain weight	Focus groups Interviews	9	an, am, ar, cu, d, i, n, ro, t	6	an, d, t
		Lodging resistance	Focus groups Interviews	6	an, am, ar, d, n, t	3	an, d
		Resistance to grain pests and diseases	Focus groups Interviews	3	an, cu, d, i, n, t	-	-
		Ability to produce two cobs	Focus groups Interviews	-	-	1	an
		Ability to tolerate high population densities	Focus groups Interviews	-	-	1	an
Scientific regime	Affecting landraces	Landraces were incompatible with hybrids' cultivation system	Focus groups Interviews	3	an, am, ar, cu, d, n, ro, t	-	-
		Farmers observed that land fertility deteriorated, preferring hybrids	Focus groups Interviews	1	am, n	3	an
Market regime	Affecting landraces	Farmers preferred hybrids within a market oriented system	Focus groups Interviews	4	an, ar, cu, d, i, n, ro, t	2	an, d
		Tortilla producers preferred hybrids (also <i>Technological regime</i>)	Focus groups Interviews	4	an, ar, d, dm, n, ro, t	3	an, d
		Farmers preferred buying tortillas to planting maize or making tortillas	Focus groups Interviews	-	-	1	an
		Landraces could not compete with hybrids' higher yield and lower price	Focus groups Interviews	2	n, t	4	an, cr, n
		Landraces could not compete with maize from other states	Focus groups Interviews	1	an, am, ar, cu, d, t	-	-
		Farmers preferred hybrid fresh corn-on-the-cob	Focus groups Interviews	3	an, d, t	2	an
	Affecting preference for specific landraces	Farmers preferred the Ancho landrace	Focus groups Interviews	3	am, d, n, t	6	cr, cu, d, dm, n
		Black and red landraces were disliked in public mills	Focus groups Interviews	1	n, ro	1	n
		Black and red landraces would cross with white maize when planted too close	Focus groups Interviews	-	-	1	ro
		Oxen yokes were abandoned, whose rent was paid with Delgado landrace	Focus groups Interviews	1	d	-	-
	Affecting maize	Other crops gained popularity: Tomato	Focus groups Interviews	2	d, n	1	an
		Fruit crops	Focus groups Interviews	1	cu, n	3	cr, n
		Nopal	Focus groups Interviews	1	an, d, dm	4	an, d, dm
		Sorghum	Focus groups Interviews	1	an, d, n, ro, t	2	an
		Rice	Interviews	-	-	1	an
		Sugar cane	Interviews	-	-	1	d

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			Focus groups (19)		Interviews (66)		
				Freq.	Landraces	Freq.	Landraces
Cultural regime	Affecting landraces	Farmers who adopt hybrids were perceived as innovative	Focus groups	2	an, cu, d, i, n, ro, t	1	cr
		Aging farmers abandoned the cultivation of distant plots	Interviews	2	cr, dm	2	dm
	Affecting maize	Fewer descendants and field workers were interested in agriculture	Focus groups	3	an, am, ar, cr, cu, d, n, t	5	an, cr, n, t
	Affecting landraces and/or maize	Farmer-donor retirement or death	Interviews	-	-	13	an, cu, cr, d, i, n
		Interviewee was working out of town	Interviews	-	-	4	an, d, ro
Policy regime	Affecting landraces	Subsidies for hybrids coupled with agricultural extension	Focus groups	2	an, d, n, ro, t	12	an, d, n, t
	Affecting maize	Ejido certification program	Focus groups	1	d	-	-
		Irrigation project in Tetela del Volcán	Focus groups	1	cu, n	-	-
Macro level	Affecting landraces	Farmers observed that dry spells' frequency increased, preferring hybrids	Focus groups	2	an, d, n, ro, t	5	an, d, n, ro
	Affecting maize	Population increase, urbanization, industrialization	Focus groups	2	an, d, n	6	an, n
Other explanations		Plots sold, rented or transferred due to owner's aging, sickness or to avoid family conflict	Interviews	-	-	4	an, d, t
		Seed lot lost to pests during storage	Interviews	-	-	2	d, n
		Introduced a different seed lot of the same landrace from relative or market	Interviews	-	-	2	an
		Introduced a different landrace more resistant to pests and with better husk	Interviews	-	-	1	an
		Introduced hybrids following the advice of landowners	Interviews	-	-	1	an
		Farmer-donor introduced hybrids but interviewee cannot recall / does not know why	Interviews	-	-	4	an, cr, d, t

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